Amateur Radio

VOL 54, No 1, JANUARY 1986

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

THE PAST

THE PRESENT

?

THE FUTURE

The Australian Electronics Monthly

IN THE JANUARY ISSUE:

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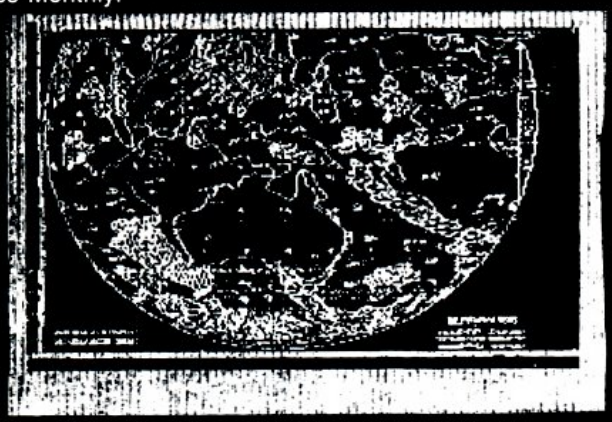

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What miniaturisation and technological advances will take place in the next quarter of a century? One can only wonder!

Amateur Radio

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Technical Features

Special Features

Regular Features

To commence the New Year, Amateur Radio has a full and varied range of articles — many technical, some newsy, some humourous and a little history, their is even an article from the industrious editor. Bill explains the whys and wherefores of FM Detectors, page 17.

Included in Amateur Radio this month is another 12 months Planner Calendar. This year it includes many historic occasions from the past and the births and deaths of many famous names, and some not so famous, yet all have achieved some degree of notoriety. It is hoped these entries will be a talking-point for members on-air — did you know that such-and-such happened today? Or who was so-and-so, and what did he achieve? It may mean bringing out the history books to find some more information, as it is only possible to whet-ones-whistle on a calendar!

The Main QSP reviews the background of Band Planning and explains the necessity for it, page 3, whilst WIA News explains the updates to Phone Patching, page 5.

Following on from the 75th Year, there is the address delivered by Richard Butler, Secretary-General of the ITU, to the Anniversary Dinner, page 5, and a volunteer sightseeing bus driver shares his experiences with readers, page 42. Also, the winners of the National Fox Hunt and the RTTY ArtContest are published.

Following on from the Editorial in November's magazine, the first list of amateurs who have been members of the Institute for 50 years or more, are published, page 57.

DEADLINE

All copy for inclusion in the March 1986 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by midday, 21st January 1986.

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Conversion:	Triple for FM (N) AM & SSB, Double for FM(W)
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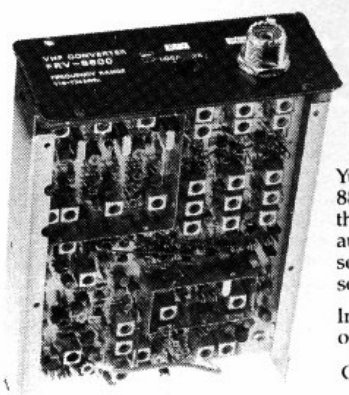

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Editor's Comment

WHY ISN'T JOE IN THE INSTITUTE?

We have all encountered Joe (or Fred or Jim or Bill or Sue) many times in our amateur careers. They have become particularly obvious during the period of the WIA 75 Award, from last March until the end of our 75th Anniversary Year on 31st December 1985. Now they will recede once again into comfortable anonymity. Of course, they are the active amateurs who do not belong to the WIA, so had to admit, with some embarrassment, when asked for their 75 Award membership number that they didn't have one. Mostly, they then felt obliged to give a reason why. Usually it was some variation on *"haven't got around to it"*, or *"off the air while moving house, so didn't bother to renew"*, or (more rarely) *"can't agree with what they are doing about such-and-such"*. Some even said *"it costs too much"*.

I would like to address a few New Year words to Joe (or Fred or Jim or Bill or Sue). Perhaps you, the WIA member whose AR this is, might show it to your nearby Joe (or whoever). Obviously this magazine is a start. Even if you were to receive only 12 issues of AR and nothing else for your annual subscription, it is still cheaper than almost any other amateur radio magazine. But there is much more! Throughout Australia you have the services of the WIA QSL Bureau. You can buy a wide range of technical books at competitive prices from the Magpubs service, via your State Division. You can buy components for home-brew projects from the service run by some Divisions. But more than anything else, you have the benefit of the status and conditions applying to the Amateur Service in Australia, almost entirely achieved to your advantage by WIA funds and effort, and WIA negotiation with the Department of Communications. *Can you really feel happy about using WIA-funded repeaters on VHF and UHF if you haven't contributed to their installation and maintenance? How about, as a non-member, participating in WIA contests?*

WIA negotiation with DOC has produced such benefits as the full recognition of the Amateur Service and its requirements, as spelled out in the new Radiocommunications Act. The right to handle third-party traffic and to use phone-patch when needed have come about entirely because of WIA representation. Our status with DOC, the Government, and the world is such that our 75th Anniversary Dinner was attended by the Secretary General of the ITU, the Minister for Communications, and leading amateurs from 14 countries. Goodwill messages were received from the Prime Minister of Australia and the President of the United States of America.

You can be proud to belong to the world's oldest amateur radio society. Perhaps you still don't like some of our policies. Join us and work to change them. You can have no effect by remaining aloof, but all members' opinions are respected in our most democratic of organisations. You, Joe, are even free to remain a non-member and still benefit from WIA activities. *But is that really what you want? Yes, Joe, why aren't you in the Institute? Why not resolve for 1986 "I am going to join the WIA"?*

Bill Rice VK3ABP
Editor
AR

Main QSP

BAND PLANNING

At the 1985 Federal Convention, the matter of Band Planning came in for considerable discussion. The Federal Council realised that well-considered Band Plans could not be developed over a few days by seven councillors, who might not even be experts in the field. Consequently, the Council opted to develop Band Plans on a continuing basis with the Federal Technical Advisory Committee preparing draft proposals for publication in Amateur Radio. Comments would be sought from members and refined Band Plans produced for ratification by Federal Councillors at the next WIA Convention.

This paper, prepared by a member of the Executive, aims to review the background to Band Planning, and set the scene for specific band oriented consideration papers, which will be published throughout the year.

HISTORICAL

In the beginning of "wireless", there was no Band Planning and indeed, little, or no legislation. It was only when the commercial applications of wireless communications became apparent, and escalating uncontrolled use of the spectrum led to interference and chaos, that controls were introduced. Many amateurs do not realise how near their hobby was to becoming totally prohibited due to interference to emergency traffic, around 1912[1].

The early international Band Planning took the form of "place the amateurs above 200 metres, they will not be a problem there[2]. As time progressed, spectrum allocation became more involved and a series of World Administrative Radio Conferences (WARC) took place. The WARCs of 1927, 1947, and 1979 probably had the greatest impact upon the amateur community; the first because it was the first international conference held, the second because of its immediate post war nature, and the ability of amateurs to use technologies and surplus equipment arising from war efforts. The third was important because of the combination of technological advances, and the need for the amateur community to speak up to retain their existing allocations under pressure from developing nations for HF allocations.

Within this frame-work, spectrum management is carried out in detail at the national level. Some nations have chosen to tightly regulate their amateur allocations, as to authorised modes, band-widths, powers and licence grades (eg USA). Others have made broad allocations, and set general regulations for orderly operating. For example, listen before transmitting, avoid interfering, and respond to emergency calls; as has happened in Australia. This latter set of circumstances accords with our stated policy of seeking de-regulation, but it brings with it an implied responsible attitude from the amateur community, which must agree and abide by its own self-generated band usage plans. Furthermore, this must encompass both the members of the national society (the WIA), and non-member amateurs.

WORLD ADMINISTRATIVE RADIO CONFERENCES

The WARCs that have influenced amateur radio in some significant manner, and some outlines of their effect are now described.

Washington 1927 International Conference

This first international conference followed after several US National Radio Conferences (1922, 1923, and 1924). The US amateurs, by this stage, had a number of harmonically related bands on 80, 40, 20 and five metres wave-length. The Conference agreed to ban spark transmissions after 1930, and allocated the spectrum from 10kHz to 60MHz. US amateurs, who had 12MHz total of spectrum prior to the Conference, ended up with 7.5MHz in all, but were covered now by international treaty and the harmonic relationship was confirmed.

Madrid 1932 & Cairo 1938

At the Madrid International Conference in 1932, "telecommunications" was defined, the International Telecommunications Union (ITU) formed from the earlier International Telegraphy Union, and regulations drafted; these were called the Convention.

At Cairo, in 1938, radio frequencies were assigned to international aviation routes[3].

WARC 1947 Atlantic City

At the Atlantic City Radio Conference, in 1947, new amateur allocations were made at 21, 144, and 420MHz. Also, other UHF/Microwave frequencies. Changes were also made to the 3.5, 7, and 14MHz amateur segments.

This was the first evidence of the appearance of amateur allocations, differing from ITU Region to Region, depending upon the political clout of the Region, and their collective attitude to amateur radio[4].

Geneva Radio Conference 1959

Pressure on the 7MHz band allocation continued at Geneva in 1959, coupled with pressure to re-allocate the top of the 28MHz band. In the event, 7MHz suffered and amateur allocations differed between Regions, whilst the 28MHz bids collapsed late in the Conference.

The contributions to the recent International Geophysical Year (IGY) by

amateurs helped their creditability, due to the period of visibility leading up to the Conference.

The need for a strong IARU presence was demonstrated, for although over 90 nations were represented at Geneva, less than 60 had established amateur radio societies.

Of particular interest to Australian amateurs was the drastic anti-amateur proposals developed by the national authority, and kept secret from the amateurs until just before the Conference. The late John Moyle VK2JU, representing the WIA, was attached to the Australian delegation and his presence contributed to the outcome, as far as amateurs were concerned, demonstrating the value of amateur representation on the national delegation[5].

WARC 1979

Nearly every amateur band was varied in some way by WARC79. Three new HF bands were allotted, and the amateur satellite service was formally established.

Changes were necessarily slow in the implementation and are being influenced by falling sunspot activity. The national Band Plans have been issued and now the amateur community is actively involved in determining its own Band Plans, taking due cognisance of neighbouring amateur users. In particular, the use of telephony on the 10MHz band is a matter of difference between the Australian amateur and his/her colleagues in most overseas countries.

Of interest for Australian amateurs was the inclusion of two of their number in the official delegation. David Wardlaw VK3ADW, and Michael Owen VK3KI contributed significantly to the Australian presence at Geneva.

GENTLEMAN'S AGREEMENTS

Many years ago, Australian amateurs realised the advantages, conferred upon them by broad government regulations, had to be supplemented by self-disciplinary constraints as to band mode usage. This led to "Gentleman's Agreements", so named because all amateurs were believed to be gentlemen who would voluntarily abide by these un-enforcable agreements on band occupancy.

In those days, CW and AM were the predominant modes, most transmissions were crystal locked to frequency and control of occupied bandwidth was not as effective as it is today. Gentleman's Agreements were derived, to a large extent, from international band planning, for DX had (and still has) a considerable influence on operating practices.

The agreements were able to absorb the change, from AM to SSB, with little worry as a reduction in occupied bandwidth per user, and consequent increased number of users able to communicate without interference resulted. However, the introduction of narrow band modes occupying a greater band width than CW, yet less than SSB and the requirement for beacons and like services overtaxed the existing system.

A similar pressure was placed on VHF Gentleman's Agreements, by the high demand for frequency pairs, for FM repeaters. In hindsight, receiver filter technology barely kept pace with the narrowing of FM channel allocations.

Ultimately, this pressure led to the near collapse of "bare bones" gentleman's agreements as first formulated and caused their replacement with more complex, but still voluntarily adopted Band Plans.

BAND PLANNING PHILOSOPHIES

The matter of Band Planning is one open to much emotional expression, it is a subject on which nearly every amateur is an "instant expert' and consideration of hard facts is always the last recourse.

Band Plans, if they are to be successful, must satisfy six principles. These are:

* *Accord with international band usage*
* *All users must be considered*
* *Spectrum must be allocated according to mode requirements and usage*
* *The Band Plan must be dynamic, yet evolutionary*
* *The Band Plan must include forward thinking*
* *Effective promulgation of the plan to members of the national society and non-members, alike*

Accord with International Band Usage — It is sensible that Australian Band Plans, for those frequency bands on which international communications are possible (and these include VHF/UHF satellite applications) accord, as far as is possible, with other nations plans.

Consider all Users — If the expectation that all users will abide by a Band Plan is to be achieved, those users must feel that their individual needs have been accommodated in some tangible way. This could range from dedicated spectrum space for popular modes to co-locating less used modes, which do not mutually interfere. Often allocation of a general, or all modes segment will suffice.

Spectrum Allocated According to Requirements — Not only must all band users interests be considered, they must also be reflected in the plan according to their preceived importance.

Often this is influenced by the popularity of the various modes, but it is also conditioned by the modes band-width demands. The allocation is always a compromise for a wide band mode like ATV, in being allocated say one channel, demands a greater band- width per active operator than say SSB to RTTY.

As well as the mode band-width requirement there are also adjacent channel compatibility considerations. Here the weak signal (EME) segment is the most demanding and is often placed on a band edge to provide some isolation. However, care should be taken to examine the national Band Plan for the spectrum user. Adjacent to the amateur band may not be a suitable neighbour for some amateur modes.

Dynamic Band Plans — It is obvious that amateur Band Planning must move with the times and remain up-to-date, yet changes must not be frequent or drastic in nature or they will be ignored and chaos will reign *(again! !).* Of recent times, the use of "layered" Band Plans, built upon a basic framework of telegraphy and telephony sub-bands, has expanded Band Planning in an evolutionary way. Layered Band Plans have a deal of transparency (to use computer 'jargon') and appear to satisfy a wide range of users and modes.

Forward Thinking — Band Plans can be forward thinking, provided they are not developed in too fine a detail. Often allocation of band space for a range of modes (having differing band-widths) will suffice. It matters not, what detailed intelligence is being carried, provided the modulation mode employed is in its assigned band segment. As an example, digital "slow scan" television can be transmitted over a range of Baud rates and it is the Baud rate which dictates the required band- width, and hence the modulation mode selected.

Promulgation of Band Plans — A Band Plan is ultimately as good as the notice people take of it, and their eventual compliance with it. If Band Plans change too frequently, or too drastically, adherence will be low through no fault of the average user. Indeed, it has been cynically said the re-learning time span of an obstinate amateur is one life span (his/hers!).

The Band Plan has to be brought to the attention of as many operators as possible, members of the national society and non- members. The latter can adopt an attitude of *"why should I co-operate? I did not agree to this plan"* and at times members in the former group adopt a like attitude. In these circumstances, the layered plan has the greatest possibility of success, as evidence by a measure of adherence to the plan.

In summary, Band Plans should be simple to apply and change infrequently to achieve acceptability by a majority of operators, yet provide adequate guidance for the way-out specialist wondering where to radiate his signal with the minimum of interference.

Specific Band Plans — It is not intended to go into the details of Band Plan allocations in this paper, but rather to highlight certain areas which need consideration in the near future.

Following dissatisfaction with discrete segment Band Plans, particularly with the introduction of exclusive narrow band mode segments, the 1985 WIA Convention adopted the layered Band Planning approach.

Furthermore, it recognised that Band Planning could not be carried out effectively over a few days at a convention. Consequently, the Council directed the Federal Technical Advisory Committee (FTAC) to develop draft Band Plans for circulation and comment throughout the year, leading to ratification at annual conventions.

HF Plans — Here the matters of interest include restructuring the generally acceptable existing plans into layered plans, obtaining agreement on narrow band mode segments, beacon allocations, and the continued use of telephony on 10MHz.

VHF/UHF Plans — Because of the high interest in FM speech communications over the last 15 to 20 years, these bands have been subjected to considerable planning with regrettably some degree of upheaval. The burning issue for Band Planning relates to the balance of band space allocated to FM repeaters, both voice and data, compared with other applications, including data communications and message storage devices (electronic mail boxes).

As the amateur service is the secondary service on UHF, the Band Plans adopted must avoid harmful interference to the primary service.

Microwave Plans — Amateur microwave frequency allocations are generally fairly similar across the three IARU Regions as an outcome of WARC79. What should therefore be an easy Band Planning task, adopting overseas plans is, unfortunately, complicated by the secondary service status of the amateur. Band Plans must be adapted to suit both national and local conditions, and frequently there are pressures, and sometimes inducements from the amateur equipment supply industry to adopt overseas standards because of the supposedly uneconomically small production runs for products especially engineered for the Australian market.

These problems have become evident in the selection of a frequency offset for repeater use on 1296MHz, whilst avoiding interference to D of A radars.

User Involvement in Band Planning — Although the development of particular Band Plans is a FTAC responsibility, they cannot do it effectively in isolation. Consequently, should you have views on any Band Planning matters, send them to your Divisional technical advisory committee or FTAC. User involvement leads to user awareness, one of the six principles upon which Band Planning is based.

REFERENCES

1 Two Hundred Metres and Down (The Story of Amateur Radio). Clinton DeSoto
2 From Spark to Satellite. Stanley Leinwoll. Chapter 12
3 Ibid, Chapter 14
4 World at their Fingertips. John Clarricoats. Chapter 26
5 Ibid. Chapter 31

AR

WIA News

PHONE PATCH UPDATE

Considerable progress has been made on phone patch for radio amateurs following two meetings in 1985, between the WIA and Telecom Australia.

It was through face-to-face discussion that both parties achieved a greater understanding of the issues surrounding phone patch. Radio amateurs have been puzzled why Telecom has restricted access to the interconnection of their radios to the telephone network.

It would also have been true in the past to say Telecom had not fully understood, and appreciated the nature of the Amateur Radio Service. The WIA, following discussions with Telecom, understands that amateur phone patch cannot be considered in isolation.

The interconnection of radio to the national telephone network is a complex matter which, obviously, has possible wide commercial application. Telecom draws a distinction between radio (voice) interconnect, and the interconnection of hobby computers to the telephone network.

Computer hobbyists are allowed to use type approved modems to interconnect their computers direct into an ordinary phone socket. But this type of interconnect cannot be used as an argument to get unrestricted phone patch for radio amateurs.

The main reason Telecom has restricted radio/telephone interconnect is to stop long distance radio links being set up in competition to the trunk telephone system. Telecom has a national carrier role, and is required to provide a uniform source at a uniform price throughout Australia. This relies on cross-subsidies from the revenue making parts of the telephone network — it believes radio interconnect could 'cream-off' revenue.

Also, part of its national carrier role is the mobile telephone service — it doesn't want direct commercial competitors in this market area. However, it does permit, with restrictions, individual businesses, and common-user groups, to interconnect radio and the phone network. There is a scale of fees charged, restrictions on coverage area, and a ban on handling traffic for third parties.

At meetings between the WIA's Federal Executive member, Jack O'Shannassy VK3SP, WIA Victorian President, Jim Linton VK3PC, and Telecom Representatives during August and October, both the Institute's and Telecom's positions were canvassed. The WIA opposed the restriction on double-ended phone patch within Australia — that is phone-radio-radio-phone interconnection. Telecom stated that this restriction applied, not only to radio amateurs, but all radio interconnects, because of its potential to bypass the Public Switched Telephone Network, and cost Telecom revenue.

The WIA does not accept that the use of double-ended phone patch by the Amateur Radio Service would have an impact on Telecom revenue, and it will continue to seek double-ended phone patch for all radio amateurs. However, as a result of cordial negotiations with Telecom, double-ended phone patch is now available for emergency use and training (see below).

The $2 per month access charge levied on radio amateurs with phone patch through their telephone account is considered by Telecom to be the lowest possible charge it could set.

What emerged out of the Telecom/WIA talks were, special conditions for the Amateur Radio Service, which follow, with WIA clarification in brackets:

The normal mode of phone patch operation is only at a home station at one end of a radio-communication service.

In a normal single ended phone patch connection, normal third party requirements will apply to conversation content.

Phone patch access for mobile units will be permitted via a home station, but not via a repeater. Phone patch connections to repeaters will not be permitted. (Repeater contacts can be phone patched, but only via a home station).

Under WICEN operation, or other emergencies involving natural disaster and/or life threatening situations, together with unavailability of normal communications, double ended phone patch will be permitted as a special exception.

Under duly authorised WICEN Exercises, training involving the use of double ended phone patch will be permitted on a self regulation basis by the Wireless Institute of Australia. The WIA will be responsible for authorising such exercises and will keep a record of such exercises and training arrangements. These records will include the details of the radio amateurs involved, the call signs, and period of authorisation. (For WICEN training, phone patch in all its forms can be used. Telecom recognises the need to train with equipment that will be used in emergencies). This authorisation procedure will be available to any radio amateur wishing to establish local community emergency arrangements to the Institute's standards of service. (This can include appropriate community service activities and public displays of the hobby).

If the WIA develops suitable circuitry and construction details for an interconnect unit, Telecom issue, subject to satisfactory testing, an appropriate "Authority to Supply for Connection to the Network". (This opens the way for homebrew phone patch which will meet Telecom standards).

Telecom will authorise a radio amateur to interconnect using this device, subject to certification by the application that the equipment has been constructed in accordance with the specifications approved by Telecom.

The above arrangements and conditions will be reviewed 18 months after publication of the interface equipment details in the Wireless Institute Journal.

The WIA plans further negotiations with Telecom, and will keep members advised.

Compiled by Jim Linton VK3PC, with the co-operation of Jack O'Shannassy VK3SP & Telecom Australia

AR

WIA Seventy Fifth Anniversary

ADDRESS TO THE WIA 75TH ANNIVERSARY DINNER BY MR R E BUTLER

Mr Chairman,
Your Excellency,
Distinguished Visitors,
Ladies and Gentlemen,

I am deeply honoured for the invitation to speak at the 75th commemorative Dinner of the Wireless Institute of Australia, the oldest Institute of its kind in the world, and to bring the greetings of the ITU as well as many amateur radio enthusiasts in contact with 4U1ITU.

Amateur radio is the only hobby provided for by the International Treaty, ie: the Radio Regulations annexed to the International Telecommunication Convention. The Radio Regulations define amateur radio as "a service of self-training, intercommunication and technical investigations carried on by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest".

Furthermore, in 1971 the World Administrative Radio Conference for Space Telecommunications provided for the Amateur Satellite Service.

Those of you who are familiar with international legislative processes would realise that these unique world-wide recognitions as well as accompanying obligations did not emerge over a few months, years or even decades. They emerged from the character, and I may add, the reliable and solid contribution of the renowned radio enthusiasts pursuing their curiosity into the radio frequency phenomenon investigation and practical operation experience, as well as a wealth of dialogue and community experience with others locally, regionally and indeed globally. These characteristics have always been manifested in the energies of your Institute; indeed the history of telecommunications in Australia is studded with the contributions of the Institute's founding fathers and its members to radio branch of telecommunications. Even before the formal establishment of the Institute, the example and brilliance of Sir Charles Todd and his team for the completion of the overland telegraph, began to orientate attention to wireless transmission. Professor William Bragg gave the first public demonstration of wireless telegraph apparatus at the University of Adelaide in September 1897, and then, in 1899, after correspondence with Marconi and financial assistance from Postmaster-General Sir Charles Todd (as always the 'Post Office' was a big help in advancing new communication ideas), wireless telegraphy messages were successfully transmitted from West Terrace to Henley Beach in South Australia.

Let us reflect, too, on the significance of H W Jenvey's contact with

the Duke of York's escort in external waters during the Royal visit in 1901. It was an early beginning of what we now describe as the Maritime Mobile Service.

The names of Bartholomew, Maclurcan, Read, Allsop, Coxon, Davis, Traeger, Reverend Flynn, and Sydney Witt (later to become a Member of the International Frequency Registration Board) also come easily to mind — a nucleus only of names, who without Fisk and Hooke and a legion of talented engineers and administrators, radio would not have developed so quickly and contributed so much to the development of the Australian Nation. The Flying Doctor's Service, School of the Air, Civil Aviation and the Public Telegraph Service and many towns and outback centres services, owe much to the co-operation stimulated or provided by those personalities and the Institute.

Reverting to the international elements, the young Institute and its band of radio activities, along with their colleagues in other countries concentrated on the study of shortwave propagation. They discovered the properties of the ionosphere, making the first inroads into space and prepared the way for the systematic division of the radio frequency spectrum, as we know it today.

Radio amateurs were thus involved in the exploration of space long before its material use with space stations and satellites.

Always evident by an active presence in world administration radio conferences, they have earned their formal recognition in the ITU statutes. Conscious also of the importance of sharing their knowledge with others, the IARU, of which your Institute is an active member in Region 3, is now co-operating with the ITU with a view to organising training courses concerning the administration of amateur radio in Africa and Asia and the Pacific.

Allow me to salute the predecessors who set the promotion of the radio techniques in action and I wish the Institute long service and prosperity.

R E Butler
Secretary-General
International Telecommunication Union
9th November 1985

NATIONAL FOX HUNT CHAMPIONSHIP

The inaugural National Fox Hunt Championships were held in conjunction with the Wagga Wagga Convention on the weekend of 26-27th October 1985, as part of the 75th Anniversary Celebrations of the WIA.

Teams representing the Australian Capital Territory, New South Wales, and Victoria took part and hunts were held on 3.5, 28, 144, and 432MHz over the two days and night hunts on 144MHz were held on the Saturday night. The lead in the Championships varied between the two Victorian teams of VK3BMV and VK3BLI, with the eventual winner being Ewen VK3BMV. Ewen's team included Geoff VK3CGH and Ian VK3BRY, and they were the recipients of the trophies and the Icom IC-2A, which had been kindly donated for the occasion by Icom Australia Pty Ltd.

The Winning Team — Ian VK3BRY, Geoff VK3CGH and Ewen VK3BMV.

Greg VK3BGW watches as Ed Webb, of Webb Electronics, presents the Icom IC-2A to Ewen VK3BMV.

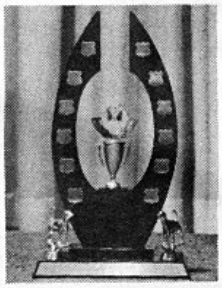
Second Place was won by John VK3YEA, Jannet, and Henk VK3BLI. They were presented with the GFS Electronic prize — a VHF UHF Power Meter.

FROM LEFT: Ewen VK3BMV, Champion Fox Hunter, and Greg VK3BGW.

Henk VK3BLI, and his team of John VK3YEA and Jannet took out the second prize, which was a VHF/UHF power meter kindly donated by GFS Electronic Imports.

Ewen was the winner of the Victorian Championships and was sponsored for travel and accommodation by the Victorian Division, so all the practice certainly paid off!

Special thanks to Icom Australia Pty Ltd, GFS Electronic Imports, Kyoshi Fukushima and Greg Whiter for their generous donations and support of this auspicious occasion. Also, thanks to the Victorian Division of the WIA and Paul VK3DIP for the loan of fox transmitters. The following from the Wagga Wagga Club also deserve special thanks for their assistance in conducting this event. Peter VK2KZZ, Geoff VK2KCL, and Peter VK2APW.



It is expected that this will become an annual event and discussions are now taking place for another location to host the event this year. This will be published as soon as possible to allow as many entrants as possible to attend.

The first prize was presented by Edd Webb, proprietor of Webb Electronics, the Albury agent for Icom equipment.

MORSE CODE PRACTICE GENERATOR

Lindsay Stronell VK3BRV
214 Jasper Road, Bentleigh, Vic. 3204

This generator is, in fact, a computer programme developed on and for an IBM-PC compatible personal computer. The object of the exercise was to produce a simple programme to generate Morse code for practice receiving skills.

However, every time it was run, I thought of a new wrinkle to add to it, hence it seemingly 'grew like Topsy'. One more addition that may be added, but as yet I have not got around to doing, is to use one of the output ports to pass the code on to the outside world, both as a tone and a TTL level signal. Maybe someone else may be able to do this.

When the programme is run, the first page on the screen asks if you are using a colour or monochrome display.

The second page asks if you want to have 10 WPM at 800Hz tone or, if you want to set the parameters yourself. You can then change the speed to anything between five and 50 WPM and the tone between 200 and 5000Hz. Also, you can send the characters at your chosen speed, whilst the spaces between them can be set to any lower speed, both between five and 50 WPM.

I have found that the Morse is much easier to learn if the characters are sent at the speed required for the test, 10 to 12 WPM, and to start with the spacing set quite slow. This enables you to hear the sound of the character as a whole and not to try to count the individual elements as dots and dashes. As you progress, just increase the spacing speed.

Just to make things a little harder and to stop the learner journalising, the code is generated as groups of random letters with a smattering of numbers. For anyone to copy this 100 percent at the exam speed, passing the exam will be 'a piece of cake'.

Good luck . . . . .

AR

```
10 '       THIS PROGRAM WAS WRITTEN BY L.STRONELL VK3BRV 15-6-85
20 '
30 '       For use on an "IBM-PC" compatible computer, using "MICROSOFT"
40 '       BASICA language.
50 '
60 '
70 '
80 CLS:SCREEN 0:WIDTH 40:COLOR 7,0:KEY OFF              'set up 1st page
90 LOCATE 1,10:PRINT "MORSE CODE GENERATOR"
100 LOCATE 3,12:PRINT "by LINZ, VK3BRV"
110 LOCATE 10,4 :PRINT "Are you using a colour display ?"
120 D$=INKEY$:IF D$="" THEN 120
130 IF D$="y" OR D$="Y" THEN 160 ELSE 140:              'yes or no ?
140 R=15:G=15:B=7:Y=15:W=7:RF=31:                       'monochrome display
150 GOTO 190
160 R=4:G=10:B=3:Y=14:W=7:RF=20                         'colour display
170 '
180 '
190 LOCATE ,,,0,7                                       'makes large cursor
200 CLS:                                                'sets up 2nd page
210 COLOR R:
220 PRINT "         ************************"          'free plug for me
230 PRINT "         *                      *"
240 PRINT "         *";
250 COLOR G:PRINT " MORSE CODE GENERATOR ";
260 COLOR R:PRINT "*"
270 PRINT "         *                      *"
280 PRINT "         *";
290 COLOR G:PRINT "    by LINZ VK3BRV     ";
300 COLOR R:PRINT "*"
310 PRINT "         *                      *"
320 PRINT "         ************************"
330 COLOR B
340 DIM A$(36)
350 LOCATE 12,5:PRINT "Press 'RETURN' for 10 wpm"
360 LOCATE 15,5:PRINT "Press 'ESC' to set parameters"
370 K$=INKEY$:IF K$="" THEN 370
380 IF ASC(K$)=27 OR ASC(K$)=13 THEN 390 ELSE 370
390 LOCATE 12,5:PRINT SPC(35):                          'clear instructions
400 LOCATE 15,5:PRINT SPC(35):                          'ditto
410 IF ASC(K$)=27 THEN 1330:                            'ESC key
420 IF ASC(K$)=13 THEN 440:                             'RETURN key
430 GOTO 370:                                           'neither key,try again
440 CH=1.65:SP=1.65:FREQ=800:                           'set up 10wpm & 800Hz
450 LOCATE 9,15:PRINT "Speed = 10 wpm":                 'display rate
460 PRINT
470 COLOR W
480                                                     'get rnd seed from clock
490 RANDOMIZE((VAL(MID$(TIME$,7,1)))+(VAL(MID$(TIME$,8,1))))
500 '

510                                                     'set up data array
520 A$(1)="01 A":
530 A$(2)="1000 B":                                     'a '1' represents a dash
540 A$(3)="1010 C"
550 A$(4)="100 D":                                      '& a '0'represents a dot
560 A$(5)="0 E"
570 A$(6)="0010 F"
580 A$(7)="110 G
590 A$(8)="0000 H
600 A$(9)="00 I
610 A$(10)="0111 J
620 A$(11)="101 K
630 A$(12)="0100 L
640 A$(13)="11 M
650 A$(14)="10 N
660 A$(15)="111 O
670 A$(16)="0110 P
680 A$(17)="1101 Q
690 A$(18)="010 R
700 A$(19)="000 S
710 A$(20)="1 T
720 A$(21)="001 U
730 A$(22)="0001 V
740 A$(23)="011 W
750 A$(24)="1001 X
760 A$(25)="1011 Y
770 A$(26)="1100 Z
780 '
790 A$(27)="01111 1
800 A$(28)="00111 2
810 A$(29)="00011 3
820 A$(30)="00001 4
830 A$(31)="00000 5
840 A$(32)="10000 6
850 A$(33)="11000 7
860 A$(34)="11100 8
870 A$(35)="11110 9
880 A$(36)="11111 0
890 '
900 '
910 FOR GROUP = 1 TO 50:                                '# of 5 chr groups
920 FOR I = 1 TO 5:                                     '# of chrs in group
930 NUMBER=INT(RND*36)+1:                               'generate random #
940 IF NUMBER>26 AND Z=0 THEN Z=1:GOTO 930:             'if a #, try again
950 CHAR$ = A$(NUMBER):                                 'get a chr
960 Z=0
970 FOR N = 1 TO LEN(CHAR$)-2:                          'search for dots & dashes
980 D$=MID$(CHAR$,N,1)
990                                                     'if a dot, make it
1000 IF D$="0" THEN SOUND FREQ,CH:SOUND 32767,CH:GOTO 1040

1010                                                    'must've been a dash
1020                                                    'so make one
1030 SOUND FREQ,3*CH:SOUND 32767,CH
1040 NEXT N
1050 E$=INKEY$:IF E$="" THEN 1070 ELSE 1060:            'if no key hit carry on
1060 IF ASC(E$)=27 THEN WIDTH 80:END:                   'exit program if ESC hit
1070 PRINT RIGHT$(CHAR$,1);:                            'display chr just sounded
1080 SOUND 32767,3*SP
1090 NEXT I:                                            'go fetch another 'un
1100 PRINT " ";
1110 SOUND 32767,5*SP:                                  'silence between groups
1120 NEXT GROUP:                                        'go make another group
1130 PRINT :PRINT
1140 COLOR RF
1150 PRINT "HIT SPACE BAR FOR MORE ";                   'Gee whiz, I'm learning
1160 PRINT
1170 COLOR W
1180 K$=INKEY$:IF K$="" THEN 1180:                      'wait for space bar
1190 IF K$=" " THEN 1720:ELSE WIDTH 80:END:             'wipe off last lot or end
1200 '
1210 '
1220 '
1230 '
1240 LOCATE LIN,31:PRINT SPC(10):          'wipe out silly entry
1250 LOCATE LIN,29:COLOR Y:PRINT " Try again ";         'display message
1260 SOUND 900,5:SOUND 600,5:SOUND 300,5:COLOR B:       'error noise
1270 FOR T=1 TO 500:NEXT T:                             'message view time
1280 LOCATE LIN,29:PRINT SPC(12):                       'remove message
1290 RETURN
1300 '
1310 '
1320 '
1330 LOCATE 13,5:PRINT "Code speed      5-50  wpm";  'display parameters
1340 LOCATE 14,5:PRINT "Tone freq.   200-5000 Hz"
1350 LOCATE 15,5:PRINT "Char. speed     5-50  wpm"
1360 LOCATE 16,5:PRINT "Space speed     5-50  wpm"
1370 '
1380 '
1390 LOCATE 13,31:INPUT WPM$                            'load new code speed
1400 IF WPM$="" THEN LOCATE 13,5:PRINT SPC(33):GOTO 1450:'no entry? wipe it
1410 LIN=13
1420 WPM=VAL(WPM$)
1430 IF WPM<5 OR WPM>50 THEN GOSUB 1240:GOTO 1390
1440 '
1450 LOCATE 14,31:INPUT FREQ$                           'load new tone frequency
1460 IF FREQ$="" THEN LOCATE 14,33:PRINT "800":FREQ=800:GOTO 1520:'default
1470 LIN=14
1480 FREQ=VAL(FREQ$)
1490 IF FREQ<200 OR FREQ>5000 THEN GOSUB 1240:GOTO 1450:'   wrong? re-enter
1500 '
```

Continued page 8

```
1510 '
1520 IF WPM > 0 THEN CH=16.5/WPM:SP=16.5/WPM:GOTO 1720: 'set up speed & wipe
1530 '
1540 LOCATE 15,31:INPUT CHAR$:                          'load character speed
1550 IF CHAR$="" THEN LOCATE 15,33:PRINT "10":CHAR=10:GOTO 1620:'     default 10
1560 LIN=15
1570 CHAR=VAL(CHAR$)
1580 IF CHAR<5 OR CHAR>50 THEN GOSUB 1240 ELSE 1600:    'oops, wrong numbers
1590 GOTO 1540:                                         'try again
1600 '
1610 '
1620 LOCATE 16,31:INPUT SPAC$:                          'load spaces speed
1630 IF SPAC$="" THEN LOCATE 16,33:PRINT "5":SPACE=5:GOTO 1700:'      default 5
1640 LIN=16
1650 SPACE=VAL(SPAC$)
1660 IF SPACE<5 OR SPACE>50 OR SPACE>CHAR THEN GOSUB 1240 ELSE 1680:'  oops
```

```
1670 GOTO 1620
1680 '
1690 '
1700 CH=16.5/CHAR:SP=16.5/SPACE
1710 '
1720 FOR J=9 TO 22:LOCATE J,1:                          'this lot wipes out the
1730 PRINT SPC(20); SPC(20):NEXT J                      'lower portion of screen
1740 '
1750                                                    'this lot lets you know
1760                                                    'what parameters you
1770                                                    'have selected.
1780 IF WPM<>0 THEN LOCATE 9,15:COLOR 8:PRINT "Speed =";WPM;"wpm"
1790 IF WPM=0 THEN LOCATE 9,2 ELSE 1820
1800 PRINT "Characters at";CHAR;"wpm spaced at";SPACE;"wpm"
1810 '
1820 LOCATE 11,1:                                       'get ready to write
1830 GOTO 460
```

WIA 75 INTERNATIONAL RTTY ART COMPETITION

Jim Linton VK3PC
WIA PRESIDENT VK3 DIVISION
412 Brunswick Street, Fitzroy, Vic. 3065

A total of 29 entries were received from Australia, North America, and Europe, making this international activity for the WIA's Anniversary Year a success.

Sadly, all VK entrants were from Victoria, despite widespread publicity no RTTY artist, or RTTY picture collector outside Victoria entered.

It is hoped this competition will spur on the art of making RTTY pictures in Australia.

Judging Co-Ordinator, Fred McConnell VK3BOU, has offered to conduct another competition,which is to be announced, by the WIA Victorian Division, during this year. Fred and his fellow judges agreed the entries received were of a high standard.

There were three categories:

a — Best hand-generated original submitted by its author, other than VK

b — Best hand-generated original submitted by VK

c — Open-Section . . . for non-original works, or computer-generated RTTY pictures

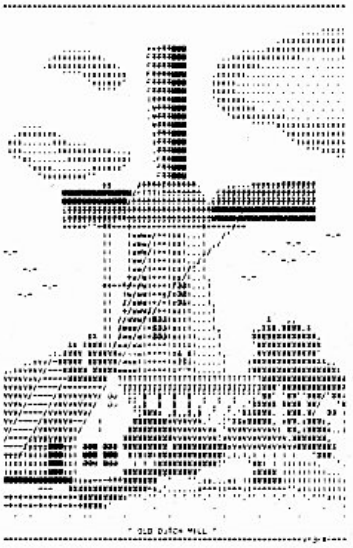
An independent judging panel comprised — Peter Ford VK3YTB; Arthur Fraser VK3BII; Fred McConnell VK3BOU; Barry Nolan SWL; and Roger Harrison VK2ZTB. Each judge was required to submit a separate judging sheet for each entry, and was asked to allocate marks out of a maximum possible 10 for the following aspects of the picture.

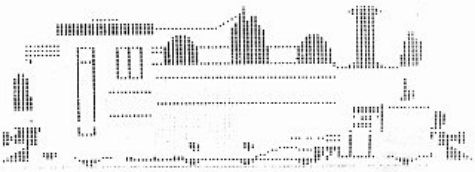
1 — Choice of subject
2 — Excellence of technique
3 — Degree of difficulty
4 — Formatting of the tape
5 — Suitability for publication

Judges points were then added up for each individual entry, with a maximum possible of 250 points.

All participants have been advised of the judging, and first in each category will receive a gold medallion. Category winners and placings follow.

PLACING	NAME OF SUBJECT	NAME/CALL SIGN	SCORE
CATEGORY A			
1st	Macaw Parrots	**Alfred La Vorgna WA2OQJ**	203
2nd	Mr President	**Alfred La Vorgna WA2OQJ**	196
3rd	Felix the Cat	**Alfred La Vorgna WA2OQJ**	190
4th	Off the the Moon	**Jas Cull VE7ARJ**	182
5th	Sparkie	**Jas Cull VE7ARJ**	176
6th	Space Age	**Jas Cull VE7ARJ**	162
7th	My Home is my Castle	**Klaus Zielski DF7FB**	156
8th	Tiger	**Wolfgang Drewes DJ2OJ**	134
CATEGORY B			
1st	Old Dutch Mill	**L Rohrlach VK3KAF**	215
2nd	Sacre Coeur	**R Tippett VK3DRT**	214
2nd	Goofy	**R Tippett VK3DRT**	214
3rd	Puffing Billy	**R Tippett VK3DRT**	207
4th	1949 MG TC	**R Tippett VK3DRT**	193
5th	Sylvester	**J Brennan VK3BNE**	187
6th	Barramundi	**R Tippett VK3DRT**	186
6th	Donald Duck	**L Rohrlach VK3KAF**	186
7th	Thought for the Day	**R Tippett VK3DRT**	176
8th	Road Runner	**R Tippett VK3DRT**	171
8th	Daniel Boone	**R Tippett VK3DRT**	171
9th	2m Ringo Ranger	**R Tippett VK3DRT**	170
10th	Iron Lady	**R Tippett VK3DRT**	159
11th	Princess Diana	**R Tippett VK3DRT**	154
CATEGORY C			
1st	Skipper	**J Brennan VK3BNE**	225
2nd	Mona Lisa	**Rudic Ladislav YU7SF**	209
3rd	Fang, a Siamese Cat	**J Brennan VK3BNE**	208
4th	I'll Drink to that	**R Tippett VK3DRT**	184
5th	Cuddles	**R Tippett VK3DRT**	179
6th	Mona Lisa	**R Tippett VK3DRT**	178
6th	Miss Collins	**L Rohrlach VK3KAF**	178

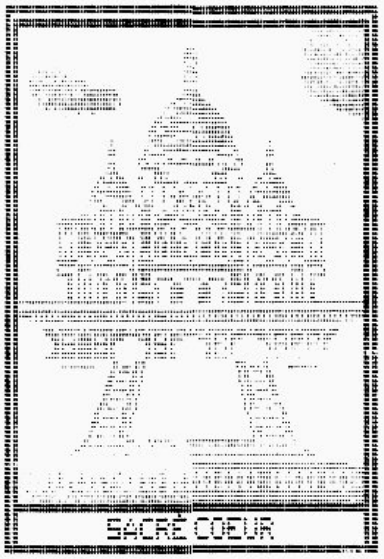




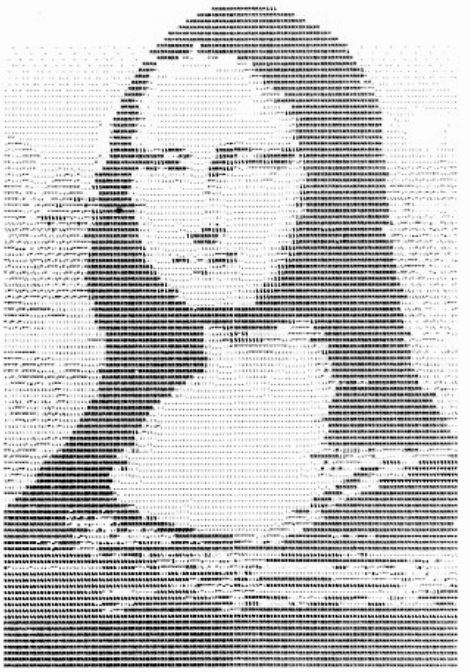
FAR LEFT: Skipper. CENTRE: Old Dutch Mill. TOP: Puffing Billy.

ABOVE: Felix the Cat. LEFT: Macaw Parrots.

ABOVE: Goofy. BELOW: Mona Lisa.



ABOVE: Mr President. LEFT: Sacre Coeur.



75 OHM HIGH PASS FILTER

Jim Preston VK6JP
14 Henley Road, Mount Pleasant, WA. 6153

One obvious cause of TVI is front end overload caused by strong signals, either fundamental or harmonic, which fall within the broad pass band of the TV receiver. This problem has been aggravated by the installation of VCRs, which are usually connected between the TV antenna and the TV receiver. Lack of, or inadequate shielding or filtering and, in some cases, diode switching in the VCR and TV receiver, compound the problem.

A recommended step in the elimination of this problem is the installation of a high pass filter at the input of the TV receiver or the VCR-TV combination. Those available commercially vary from the cheap and useless to the adequate but expensive. The filter described here can be built for about $10 if all the components have to be purchased, and much less if the junk box is helpful.

The design is substantially one described in QST of February 1982. The construction details in that article were not really concise and this article is an attempt to describe a filter which can be constructed using components readily available in Australia, and PCB artwork, which can be easily produced so that the performance of the filter can be duplicated without recourse to expensive test equipment.

CHOICE OF FILTER TYPE

High pass filter choice is restricted to a decision between Butterworth and Chebyshev designs. Their relative merits can be briefly summarised by stating that the Butterworth filter has a flat response in the pass band, while the Chebyshev has a steeper attenuation slope, but has a ripple in the pass band. This ripple can be designed to be about 1dB, so it is no disadvantage for this application.

Having decided on the type of filter, the number of elements can be selected. The seven element filter has a good attenuation slope (42dB/octave) without becoming too bulky. Traditional design methods for filters usually end up with non-standard capacitor values, but Wetherhold(1) used a computer to calculate designs based on standard capacitor values. This calculation provided parameters of all possible filter designs using standard capacitor values providing values of C and L, reflection coefficient, and cut-off frequency. Thus, small variations in cut-off frequency and reflection coefficient could be made to fit in with the standard capacitor values. In practical terms, if a cut-off frequency of 50MHz was desired and standard values of capacitor gave cut-off frequencies of 48 or 52MHz, the design would still be adequate. While a low reflection coefficient is desirable, a value of 20 percent produces a VSWR of 1.5. Most tabulated designs hold the reflection coefficient to six percent or less.

CIRCUIT DESCRIPTION AND CONSTRUCTION

The selected circuit configuration and component values are shown in Figure 1. The capacitors used are NPO and 10 percent tolerance. The inductors were wound on Amidon T37-0 toroids. This inductor type is self shielding, allowing the filter construction to be very compact. The required number of turns should be evenly spaced around the circumference of the toroid, leaving about 6mm between the ends of the winding. A little acrylic cement will hold the turns in place.

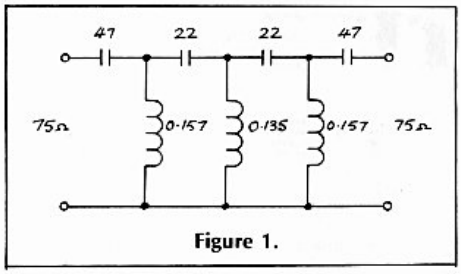


Figure 1.

Double sided fibre glass PC board was used as a base for mounting the components, the underside being used as a ground plane. The upper surface pattern is shown in Figure 2, and takes the form of a micro-strip line. Both sides of the top copper foil were connected to the lower ground plane by drilling three holes at each outer edge and soldering wire 'rivets'. Layout of the components is shown in Figure 3.

Coaxial cable with Belling Lee type coaxial fittings was used to connect the filter into the TV antenna lead. If a line socket is used on one end of the filter and a line plug is used on the other, no modifications to existing equipment or antenna leads is necessary. The coaxial cable should be good quality 75 ohm (RG59 or similar). Solder at least some strands of the copper sheath of this cable to the connector, or later corrosion may introduce a whole new set of problems. At the PC board the braid was connected to both edges of the strip line using a tinned copper wire saddle.

The PC board fits neatly into a plastic 35mm film container. Holes to suit the type of cable used (usually 5 or 6mm) are drilled in the bottom and lid of the container and these items fitted over the coaxial cable before soldering the cable, complete with connectors to the PC board. Convenient lengths of cable were 100mm for the container end and 80mm for the lid end. The filter is symmetrical so input and output are interchangeable.

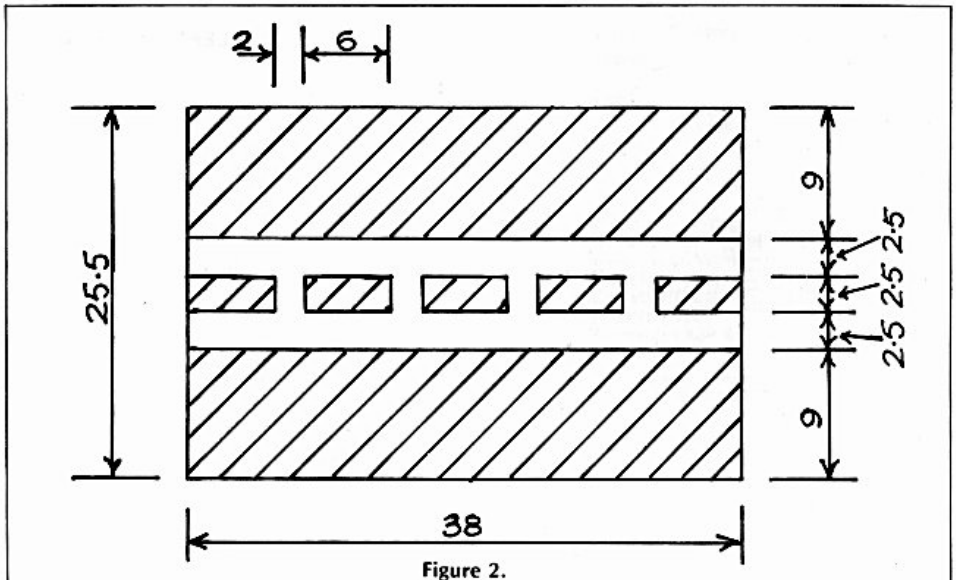


Figure 2.

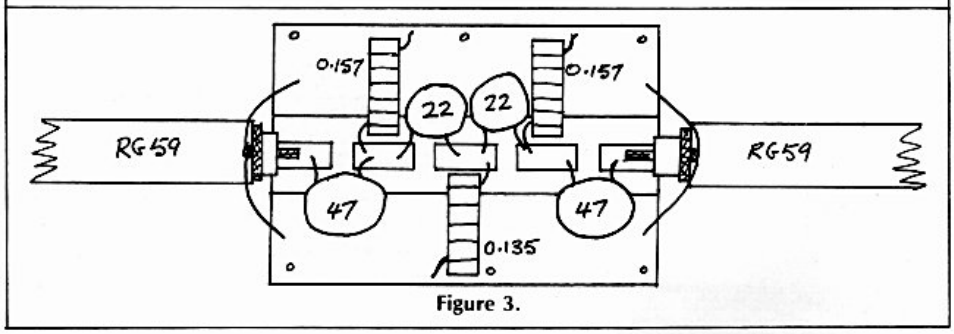
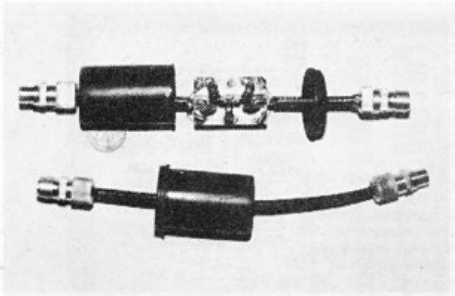


Figure 3.



The finished filter.

PC ARTWORK

No special artwork or photographic processes are required. Both sides of the board are covered with vinyl label obtained at any stationery shop. The ground plane requires no etching. The top side if the board simply has the strip line pattern drawn on the label stuck to its surface and the parts required to be etched, removed with a razor blade or scalpel. Take care to remove all traces of the adhesive from the label, or etching will be patchy. The PC boards are so small that one large label will enable three boards to be produced. Similar results can be obtained using a Dalo resist pen, but labels are cheaper than buying a pen especially for one board.

The board is etched using the usual methods and Ferric Chloride. After etching, the vinyl labels can be removed using thinners.

PERFORMANCE

The performance of a high pass filter can be judged by tabulating the frequencies at which three or four values of attenuation occur, and by checking the response in the pass-band. The response in the pass-band is particularly important when the filter is connected to a TV receiver, since any unwanted variations can degrade TV picture quality. The pass-band in this filter was within 1dB between 56MHz and 450MHz.

The efficiency of the filter as an attenuator of frequencies outside the pass-band can be determined by checking F-Ap, F3dB, F30dB and perhaps F50dB. The last three are the frequencies at which the subscripted levels of attentuation occur, ie 3dB, 30dB and 50dB. F-Ap is the frequency at which the pass-band attenuation level first exceeds the peak amplitude of the pass-band ripple which in the case of this filter happens to be 1dB. In practical terms, it is the corner frequency. Measurements of the parameters were difficult with the equipment available, requiring interpolation and a certain amount of estimation. The shape of the response did conform to that calculated, with F-Ap at 56MHz, F3dB at 51MHz and F30dB at 35MHz. It was not possible to determine F50dB, but the curve indicated increasing attenuation with decreasing frequency, so that the response at 14MHz could be expected to be about 70dB down.

CONCLUSION

This filter can be constructed without access to any special equipment or components. Four units have been built, and all show a similar response. Thanks are due to VK6NG, who assisted with the testing of the filters, and to VK6DV who tested one on his VCR, thereby cleaning-up his TVI problem.

NOTES: (1) E WETHERHOLD, '7-element 50-ohm Chebyshev Filters Using Standard-Value Capacitors', RF Design, February 1980, p26.

AR

Did you know?
FM Radio was first demonstrated on 5th January 1940.

SECOND OPERATOR — COMPUTER STYLE

Roy Taylor VK3BTL,
Box 554, Morwell, Vic. 3840

A computer used around the shack as a second operator will soon develop a personality, if it can talk. It is then able to give amusing/abusive error messages using the spoken word. And, when in a more serious mood, it is able to output spoken data to tape rather than digital data. This is sometimes better than hard copy, and cheaper than a printer.

My second operator is attached to a Dick Smith system 80 and resides at output Port FB (251). the interface circuitry is shown in the accompanying diagram.

CIRCUIT DESCRIPTION

Z3 and Z4A decode the address FB hex and Z1 combines the input/output request (IORQ) and either a write (WR) or a read (RD) to form enable signals for Z2 and Z5.

Z2 is an eight bit register and is used to latch information present on the data lines as its Pin 11 goes low.

The first six of these latched data lines are connected to the SPO256 Speech Processor Unit (SPU) and are latched into its input buffer when any input makes a low to high transition. The other two data lines from Z2 are connected to Z8, a 'D' type latch. The Q output of Z8 is set true or false by the code on these two data lines connected to its 'D' (data) and 'C' (clock) inputs; and are used to start and stop a cassette recorder via its 'remote input' socket.

Z5 is a hex buffer with tri-state outputs and is used to read the SBY (standby) and LRQ (load request) lines of the SPU onto the data bus when its Pin 1 goes low, whenever Port FB is read.

The codes output to the SPU determine the ALLPHONE (sound) to be uttered. By sequentially outputting codes, words are formed.

Z9, a 4N28 opto isolator, allows a voltage level translation between the interface unit and a cassette recorder remote socket, to enable the recorder to be started and stopped by our software. The audio output from Z7 may be connected to an 8ohm speaker or to an auxiliary input of the tape recorder, as required.

THE SPU

This is a SPO256-AL2, obtained from Radio Shack (Part Number 276-1784) and cost $25. It came supplied with a booklet which contains a list of the codes for the allphones, silent periods and a vocabulary. Also contained are some interesting and helpful tips on forming words. The crystal specified for the SPU is 3.12MHz, but I used a 3.5 meg chrominance crystal and it sounds okay.

PRINTED CIRCUIT BOARD

The patterns shown are for a double sided board. The audio circuit is built on a ground plane and the holes drilled from the bottom of the board will need to be relieved with a 3mm drill to get clearance between component leads and the ground plane. A wall is built around the audio circuit to form a shield. This is built with 25mm wide, PC board scraps, which were soldered to the ground plane.

READING AND WRITING TO THE SPU

The Allphone codes are to 63, only six lines are required to output these to the SPU via Z2.

Before outputting a code, we need to initialise by outputting a zero to port FB (OUT 251,0). This ensures that no matter what the next code out is, a low to high transition must occur on at least one of the data lines and the SPU will latch the code into its input buffer. Next, we output the code for the required allphone, say an 'R' (code 14 decimal); so we (OUT251,14) and the SPU SAYS 'R'. Prior to saying 'R', the SPU transfers the input code from its input buffer to internal logic for decoding and uttering. This action clears the input buffer and the status of the input buffer is flagged by the LRQ output of the SPU. LRQ is a logic 1 when the input buffer is full, and when it is at a logic 0 the input buffer may be reloaded. The SBY output of the SPU flags when the SPU is inactive by outputting a logic 1. The status of the LRQ and BSY outputs are connected to data lines D4 and D5, when Z5 is enabled with a read instruction — A=INP(251).

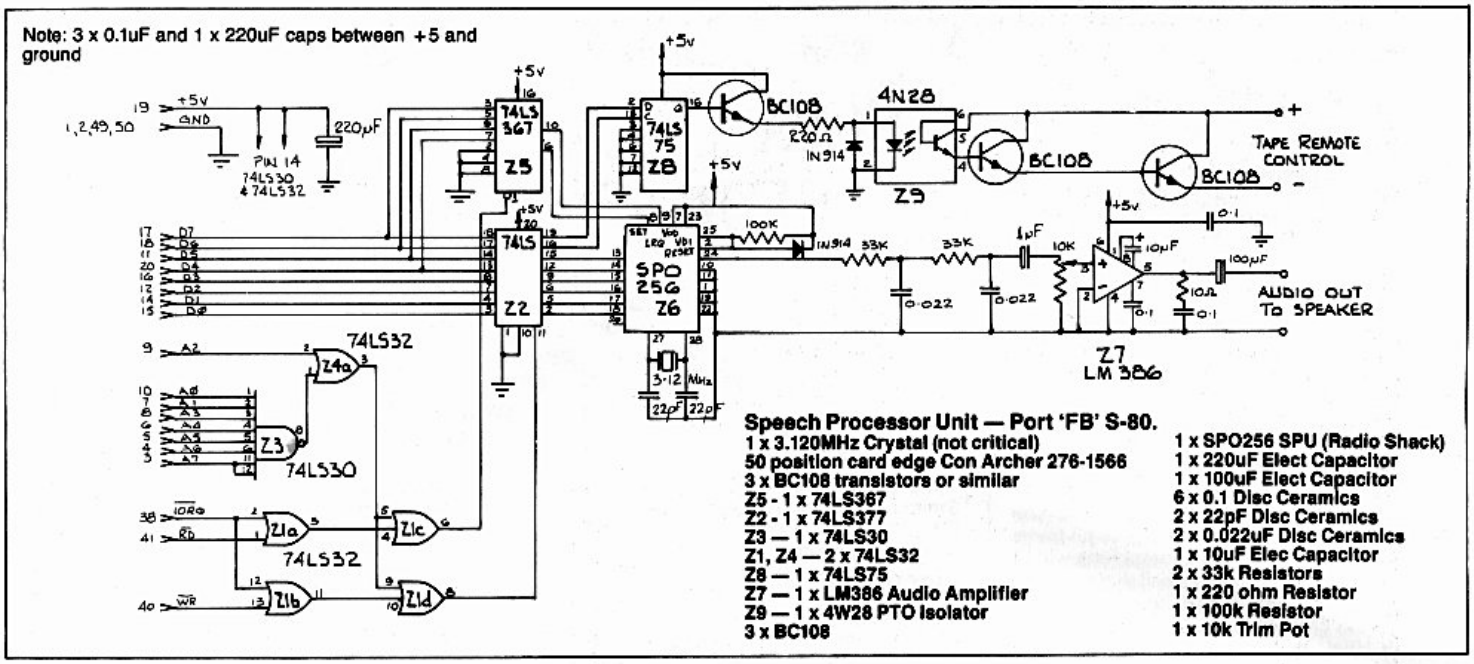
Let's have a look at what the instruction, A=INP(251), will return. Firstly, this will cause all data lines to be read, so let's have a look at the status of the data lines. The data lines D0 and D3 are floating and will return all ones (=15 DECIMAL); so the value of 'A' will return 15 plus the value of data lines D4 to D7. The following table sets out the status of the SPU and the value of 'A' after a A=INP(251) instruction.

LRQ STATUS	SBY STATUS	A=INP(251)=
0	1	16+15=31
0	0	0+15=15
1	0	32+15=47
1	1	48+15=63

Whenever the SPU is not able to receive an input code, the value of 'A' returned by an input instruction will be greater than 31.

Here is a subroutine to check the SPU status, and output code to it. The calling programme constructs G$ . . . . .

```
10 G$="27,7,15,53,53,4
20 REM----UTTER G$ ROUTINE----
30 FOR UT=1 TO LEN G$
40 U$=MID$(G$,UT,1)
50 IF MID$(G$,UT+1,1)="," THEN 80
60 U$=U$+MID$(G$,UT+1,1)
70 UT=UT+1
80 UT=UT+1
90 U=VAL(U$)
100 GOSUB 140
110 NEXT UT
120 RETURN
130 REM---OUTPUT ONE CODE TO SPU----
140 OK=INP(251)
150 IF OK )31 THEN 140
160 OUT 251,U
170 OUT 251,0
180 RETURN
```



Speech Processor Unit — Port 'FB' S-80.

1 x 3.120MHz Crystal (not critical)
50 position card edge Con Archer 276-1566
3 x BC108 transistors or similar
Z5 - 1 x 74LS367
Z2 - 1 x 74LS377
Z3 — 1 x 74LS30
Z1, Z4 — 2 x 74LS32
Z8 — 1 x 74LS75
Z7 — 1 x LM386 Audio Amplifier
Z9 — 1 x 4W28 PTO Isolator
3 x BC108
1 x SPO256 SPU (Radio Shack)
1 x 220uF Elect Capacitor
1 x 100uF Elect Capacitor
6 x 0.1 Disc Ceramics
2 x 22pF Disc Ceramics
2 x 0.022uF Disc Ceramics
1 x 10uF Elec Capacitor
2 x 33k Resistors
1 x 220 ohm Resistor
1 x 100k Resistor
1 x 10k Trim Pot

Upon returning to the calling programme, this code must be executed.

OUT 251,1

Then code '1' is the code for a silent period. Any silent period code signifies to the SPU, the end of an utterance.

Incidentally, the code used in G$ in the above example will say "HELLO".

The programme listed below will enable the second operator to be put to use immediately, and is useful for establishing a vocabulary for him.

The programme allows you to:

TEST ALLPHONES, HEAR ALL ALLPHONE, CREATE WORDS AND TEST THEM AS YOU GO, LPRINT WORDS YOU FORM-TOGETHER WITH THE CODES, REPEAT WORDS ENTERED, AND CHANGE CODE.

If you start each word with decimal 90, it then allows you to type in the word to be coded. Entering a decimal 99, will cause the code entered so far to be uttered and then present a selection menu.

If an invalid code is entered, a spoken error message will be uttered. SOme people may find it mildly offensive, if this is so, change the code in line 150.

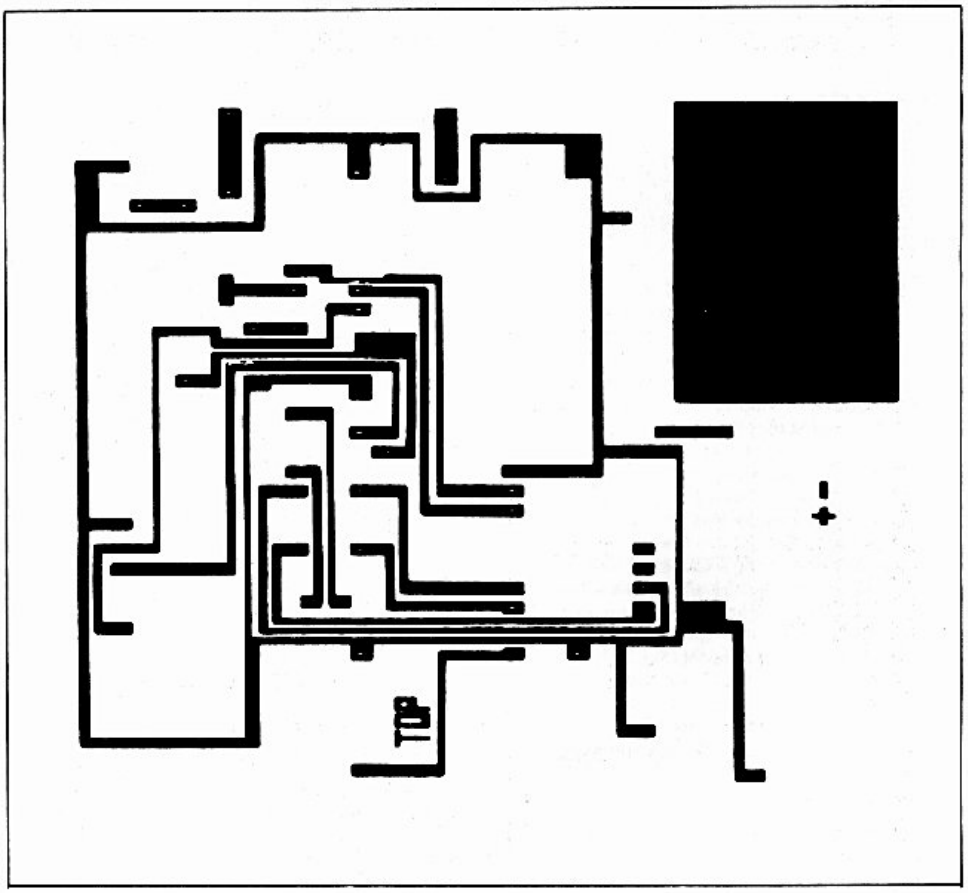
STARTING/STOPPING THE CASSETTE DRIVE

One of the four 'D' type latches in Z8 is used to start and stop the cassette, via the 4N28 opto isolator. The Q output will follow the D input whenever the C (clock) input is high.

To turn on the BC108, Q needs to go high and to do this we output a high on data lines D7 and D6 (OUT 251,192), this makes D and C inputs to Z8 high and the Q output will go high. To latch it in this condition we need to lower the clock input with OUT 251,128 and OUT 251,0 instructions.

To stop the cassette drive we need to output a high on D6 (C) and a low on D7 (D), ie — OUT 251,64.

```
5 ROUTINE TO TURN CASSETTE ON...
10 OUT 251,192
20 OUT 251,0
30 RETURN
35 ROUTINE TO TURN CASSETTE OFF...
40 OUT 251,64
50 RETURN
```

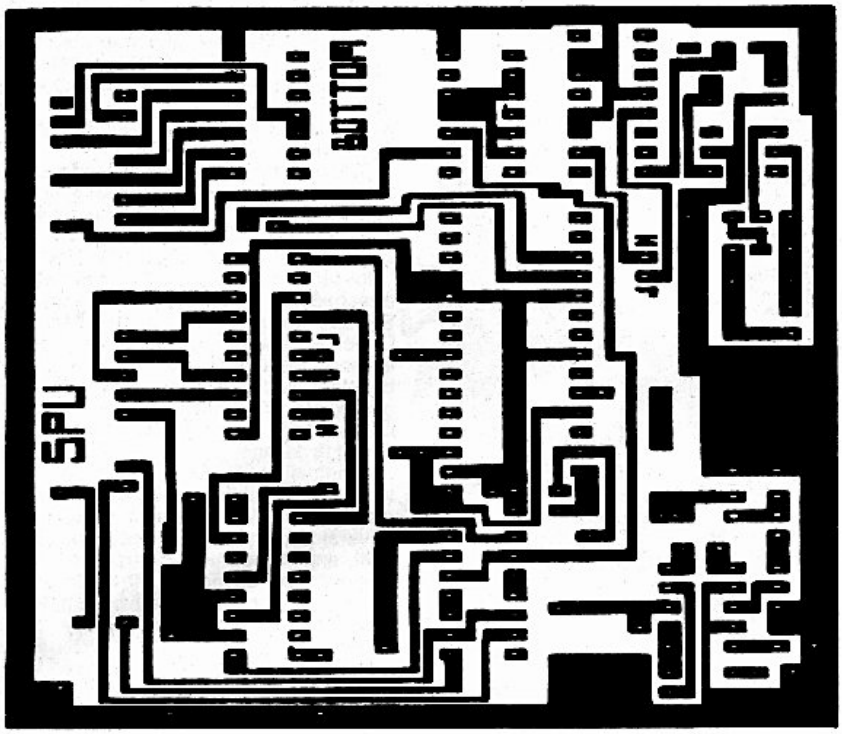


NOTES . . . . .

The prototype was built on veroboard and two subsequent ones built on PC boards. They can be mounted in a suitable box and connected to the micro, via the expansion unit edge connector. Mine is mounted in a box with a printer interface and the control, data and address lines paralleled to printer interface and the SPU.

One other thought, when the SPU was used in a satellite prediction programme; the voice slowed down more and more as the programme was developed. This was due to the fact that as more strings and variables were added to the programme, the time to access them increased. And, as the SPU part of the programme used strings to form the allphone codes for vocalisation, the rate at which codes were presented to the SPU decreased and it spoke in slow motion. To overcome this, I entered a machine language code above MEMTOP to output codes in real time to the SPU. The codes to be uttered were stripped from the strings in which they had been assembled and POKED into memory above MEMTOP and below the machine code, ie — the machine code started at 31500 and the codes to be output were stored at 31000 up. Upon first firing up the system, 31000 was input before hitting the RETURN to reserve the memory required.

AR




```
10 REM  PROGRAMME TO OUTPUT CODES TO THE 'SPO-256'
20 REM              TALKING SPEECH UNIT
30  REM                  ROY TAYLOR        26/4/85
40 REM  ------------------------------------------------
50 REM              SIGNAL STATUS TABLE
60 REM------------------------------------------------
70 REM  LRQ    SBY   INP(251)   BUFFER   STATUS
80 REM   0      1       16(31)    NT      LOAD - 'FREE
90 REM   0      0        0(15)    NT      LOAD - 'BUSY
100 REM 192  TURNS  CASSETTE  ON  AND 64 TURNS IT OFF
110 REM  ------------------------------------------------
120 CLEAR 500:DIM T (500):DIM AL$(63):DIM NW$(500):CLS:GOSUB 520
130 CLS:G$="27,7,62,45,53,2": GOSUB 880
150 E$="63,30,45,37,27,12,12,13,1"
160 REM----GET CODE---------------
165 P$="55,1,13,59,1,13,2,19,1,50,2,46,52,21,46,12,29,29,2,11,6,11,3,13,19,1":G$=P$: GOSUB 880
170 PRINT "ENTER 98 TO START EACH WORD, AND 99 ON TEST."
180 FOR K=1 TO 500:PRINT"STEP";K;:INPUT T(K):IF T(K)99 THEN250
190 IF T(K) =99 THEN 270
200 IF T(K)() 98 THEN 220
210 INPUT "WORD TO BE CODED"; NW$(K):NEXT K
220 IF T(K))63 THEN 250
230 IF T(K) =0 THEN 250
240 U=T(K):GOSUB 850:U=1:GOSUB 850:NEXT K
250 K=K-1:G$=E$:GOSUB 880:NEXT K
260 REM '-----CODE TO SPU-----------
270 FOR N=1 TO 500:U=T(N):IF U=99 THEN 290 ELSE IF U=98 THEN NEXT N
280 GOSUB 850: NEXT N
290 U=1:GOSUB 850
300 REM'----PRINT STEPS & CODE------
310 CLS:FOR PO=1 TO K:IF T(PO)=98 THEN 330 ELSE IF T(PO)=99 THEN 350 ELSE PRINT "STEP";POT(PO),
320 NEXT PO
330 PRINT:PRINT NW$(PO),:NEXT PO
340 REM'----SELECT OPTION---------
350 PRINT:INPUT"REPLAY=R BACK=B CHANGE=C TEST=T ALLPHONES=A LPRINT=L":G$
360 NT=0
370 IF G$="A" THEN GOTO 720
380 IF G$="T" THEN GOTO 760
390 IF G$="R" THEN GOTO 270
400 IF G$="B" THEN GOTO 450
410 IF G$="C" THEN GOTO 470
420 IF G$="L" THEN GOTO 480
430 G$=E$:GOSUB 880:GOTO 350
440 REM'----EXECUTE OPTION--------
450 INPUT "STEP NUMBER";NT:G$="":IF NT=0 THEN K=K-1 ELSE K=NT-1
460 NEXT K
470 INPUT "STEP NUMBER";NT:G$="":PRINT NT;:INPUT NC:T(NT)=NC:GOTO 270
480 FOR PO=1 TO K:IF T(PO)=98 THEN 510 ELSE IF T(PO)=99 THEN 500 ELSE LPRINT T(PO);",";
490 NEXT PO
500 LPRINT:GOTO 300
510 LPRINT:LPRINT NW$(PO),:NEXT PO
520 REM'----ALPHONES AND CODE---------
530 AL$(1)=" PA2 30ms":AL$(2)=" PA# 50ms":AL$(3)=" PA 4 100ms"
540 AL$(4)=" PA5 200ms":AL$(5)=" OY -LV":AL$(6)=" AY -LV":AL$ (7)=" *EH -SV": AL$(8)=" KK3"
```

Programme continued on page 14

What's in a Name?

Alan Shawsmith, VK4SS
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A description of what we are, or supposed to be as a fraternity, surfaces regularly in various magazines. It may be timely to take a more concerned look at ourselves in order to find the best possible term to fit our activities.

In this country, our first official designation was EXPERIMENTER. Between the years 1905 and 1925, WWI excepted, those who could convince the government they possessed sufficient knowledge, ability and integrity were issued with a licence, which allowed them to EXPERIMENT with WIRELESS. Some could **receive** only, not **transmit.**

It would be nice to add the tag COMMUNICATOR and or PATHFINDER to these very early few who found themselves infatuated with the miracle of being able to send signals through space without the aid of umbilical wires (telegraph). However, such titles best fit those who immediately followed this first stage of the art.

History shows that the first decade of the 20th century was given over largely to much 'cut and try' EXPERIMENTING. Initially, it was necessary to understand the function and effects of resonance, capacity, inductance, detection tuned circuits, amplification, etc. Also, the theory of 'feedback' was known and the vacuum tube still in its most primitive phase.

However, by the 1920s, the term PATHFINDER was applicable. The LF and MF spark transmission with limited range had given way to vacuum tube rigs capable of HF inter-continental daylight DX on QRP. Just like Edwin Armstrong's first step on the surface of the moon, which he described as 'small for him but big for mankind', so the PATHFINDERS now began to realise the potential of the world as an electronic global village.

About this time, the word AMATEUR began to displace EXPERIMENTER. Several reasons can be offered for this. Firstly, more time was spent in on air COMMUNICATING rather than in pure EXPERIMENTATION; MW broadcasting and commercially manufactured radios and component parts had put in an appearance and in Australia, the PMG had introduced the AMATEUR Operators Proficiency Certificate (AOPC). These 'firsts' helped to identify our activities in relation to the more corporate interests of others. By the year 1930, the word AMATEUR was our common nomenclature — and it is still with us to the present time, 60 years later.

Many argue that the word is low on definition, while others complain it carries the undesirable connotation of lacking skill and training. Let us pause here and examine this concept of our image. How amateur or professional, are we? It is only necessary to tune across the bands to realise we are more amateur than professional — mostly our operating techniques are below commercial standards. However, a minority are as professional as the art will allow and this goes for clubs and many other amateur activities, as well. By virtue of a variety of circumstances beyond his control, the AMATEUR must remain what he is — but always with one goal in mind, to be as PROFESSIONAL as is possible.

In reality, the post WWII amateur might be better described as a RADIO COMMUNICATOR or simply a COMMUNICATOR. It is generally accepted that the main occupation is no longer experimenting or pathfinding. Rather it is 'rag chewing' or chasing DX, using a repetitive structured form of A1 or A3 exchange. Again, the word COMMUNICATOR like AMATEUR, also lacks definition; there is a wide variety of the species, from broadcast disc jockeys to aircraft and other controllers, etc, etc.

Officially we are operators in the amateur service. Some would quite rightly ask, *"What service — and how many operators participate in it during their lifetime?"* Good question! To reply:

Continued on page 14

From previous page

```
550 AL$(9)=" PP":AL$(10)=" JH":AL$(11)=" nn1":AL$(12)="*IH -SV"
560 AL$(13)=" TT2":AL$(14)=" RR11-Res":AL$(15)="*AX -SV":AL$(16)=" MM"
570 AL$(17)=" TT1":AL$(18)=" DH1":AL$(19)="*IY -LV":AL$(20)="EY-LV"
580 AL$(21)=" DD1":AL$(22)=" UW1-LV":AL$(23)="*AO -SV"
590 AL$(24)="*AA -SV":AL$(25)=" YY2-Res":AL$(26)="*AE -SV":AL$(27)=" HH1"
600 AL$(28)=" BB1":AL$(29)="*TH":AL$(30)="*UH -SV":AL$(31)=" UW2-LV"
610 AL$(32)=" AW -LV"
620 AL$(33)=" DD2":AL$(34)=" GG3":AL$(35)=" VV":AL$(36)=" GG1"
630 AL$(37)=" SH":AL$(38)=" ZH":AL$(39)=" AR2-Res":AL$(40)="*FF"
640 AL$(41)=" KK2":AL$(42)=" KK1":AL$(43)=" ZZ":AL$(44)=" NG"
650 AL$(45)=" LL -Res":AL$(46)=" WW -Res":AL$(47)=" XR -RV":AL$(48)=" WH"
660 AL$(49)=" YY1 -Res":AL$(50)=" CH":AL$(51)=" ER1-RV":AL$(52)=" ER -RV"
670 AL$(53)=" OW -LV":AL$(54)=" DH2":AL$(55)="*SS":AL$(56)=" NN2"
680 AL$(57)=" HH2":AL$(58)=" OR -RV":AL$(59)=" AR -RV"
690 AL$(60)=" YR -RV":AL$(61)=" GG2":AL$(62)=" EL -LV":AL$(63)=" BB2"
700 RETURN
710 REM----OUTPUT ALPHONES-----------
720 CLS:FORG=1 TO 63:PRINT G;AL$(G),
730 U=G:GOSUB 850:U=4:GOSUB 850
740 FOR LL=1 TO 150:NEXT LL:IF G=4 THEN CLS
750 NEXT G:GOTO 300
760 REM----SINGLE SOUND TEST-----------
770 CLS:FOR G=5 TO 63:PRINT G;AL$(G),:NEXT G
780 PRINT @ 938,"";
790 INPUT"99=return. CODE";CT
800 PRINT @ 938,"              ";:IF CT(64 THEN 820
810 IF CT=99 THEN 300
820 PRINT @ 941,AL$(CT);:FOR G=1 TO 3
830 U=CT:GOSUB 850:U=4:GOSUB 850
840 FOR TD=1 TO 200:NEXT TD:NEXTG:GOTO 780
850 REM----OUTPUT ONE CODE TO SPU--------
860 OK=INP(251):IF OK()31 THEN 860
870 OUT 251, U:OUT 251,0:RETURN
880 REM----UTTER G$----------------------
890 FOR UT=1 TO LEN(G$)
900 U$=MID$(G$,UT,1):IF MID$(G$,UT+1,1)="," THEN 920
910 U$=U$+MID$(G$,UT+1,1):UT=UT+1
920 UT=UT+1:U=VAL(U$):GOSUB 850:NEXT UT
930 RETURN
```

From previous page

WICEN is a State and Nationally organised body, but very, very few of the total VK amateur population ever become part of it. WICEN members spend time drilling themselves to cope with an emergency, which they hope will never happen — but if it does occur, they are likely to be the last called upon to render assistance anyway. Not exactly a role of substance! Those interested in third party traffic can now perform a community service as reciprocal arrangements exist with certain countries. Again, only a minority are ever likely to provide such a service, especially as **inconsequential** messages ONLY are allowed. When official approval is given, phone patching is another resource the amateur can offer to the public. But again, how many will provide the facility — very few!

The truth is that most VKs are only interested in 'doing their own private thing'. Is this attitude now good enough? The answer is NO, if we are to gain greater respect and recognition from the community at large.

The word AMATEUR, in radio, is traditionally associated with a quick willingness to assist others but, after 60 years with a title that does little for our status, many feel we are overdue for a new and more dignified label. This brings us to the nitty gritty of the whole discourse — what name? ?

The word EXPERIMENTER has been put forward again. In my view it is preferable to AMATEUR. Unfortunately it no longer realistically describes our main activities. Three recent suggestions are PRIVATE RADIO OPERATOR (PRO), PRIVATE RADIO STATION or PRIVATE RADIO SERVICE (PRS). Like the word AMATEUR, these titles are not very precise but, are certainly more dignified and broad enough to allow the operator to pursue his own particular interest, either that of community service or self concern.

The universal need now, is to find an upgraded title, one internationally acceptable, that does justice and which will carry us into the 21st century — quite likely a difficult and polemic exercise. *Any other suggestions? ? ?*

AR

VICTORIAN RAILWAYS INSTITUTE WIRELESS CLUB — VK3RI

Australia's Oldest Radio Club

Kevin Crockett VK3CKC
SECRETARY 1985
47 Goulburn Drive, Rowville, Vic. 3178

The following is a brief history of the Victorian Railways Institute Wireless Club, which is 59 years old this year. A more complete history is being written to mark the 60th anniversary, next year.

An entry calling for persons interested in the formation of such a Club was posted in a Victorian Railways internal publication, THE WEEKLY NOTICE, for the weekending 18th May 1926. A meeting was subsequently held on 1st July 1926, and the Club was born.

The call sign VK3RI was taken out in 1927.

During the early days the Club broadcast music, and other items of interest, from the Clubrooms within the Flinders Street Station buildings. Various rooms have been used over the years, with the present location being Room 410. Dances, exhibitions, and raffles were held, the proceeds of these functions, together with member subscriptions, kept the Club in a healthy financial status. This was at the time when amateur radio was in its infancy and compared to today, was a novelty.

Around 1930, the Club was able to boast a membership in excess of 150 members.

During the war years, vital Club equipment was placed in storage, and many members joined the Armed Services and Merchant Navy. A few did not return.

Broadcasting of music by amateur stations was prohibited in the mid 1940s, which resulted in a decline in membership. The advent of solid state and transistor technology, and the Club's failure to keep pace, exacerbated the decline.

In 1954, the Club's antennas, which were attached to the clock tower above Elizabeth Street, were removed due to a Royal Visit by Queen Elizabeth II, as they were apparently an eyesore. Beauty, of course, is in the eye of the beholder, and obviously some were unable to appreciate the inherent beauty of such a construction. Henceforth, membership continued to decline.

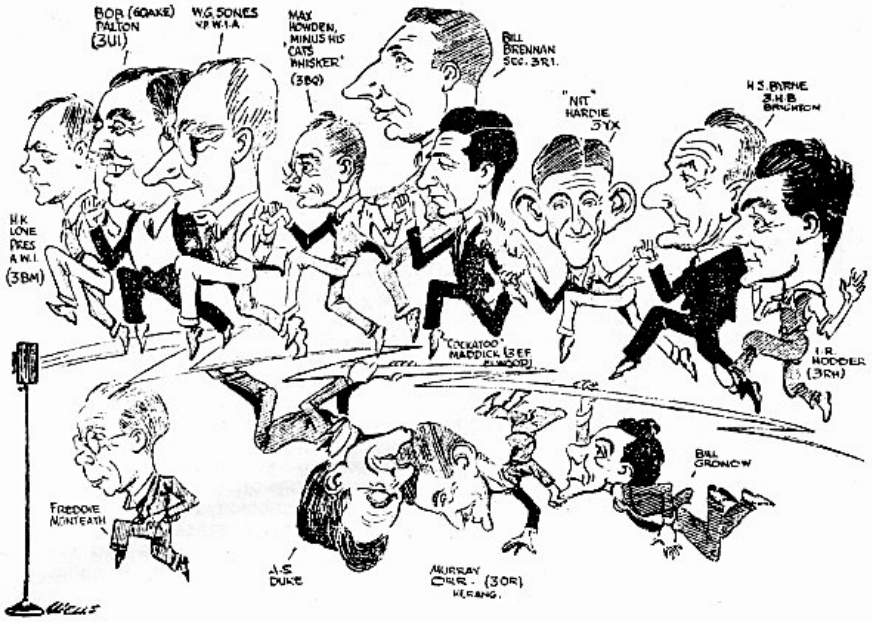
Eventually, in 1959, a plea went out to any technically qualified, and persons, who might make themselves available to an ailing club. Several transmitting and receiving items were built, and some minor items were purchased. However, the advent of television and consequent interference caused by amateur transmissions on nearby frequencies led to even further diminishing activity.

Dances, and the revenue derived from them ceased, and the advent of more modern transmitting modes (SSB and FM), made the Club's equipment obsolete. For various reasons the Club could not afford to purchase new equipment, and interest turned to tape recordings and music — not for transmitting.

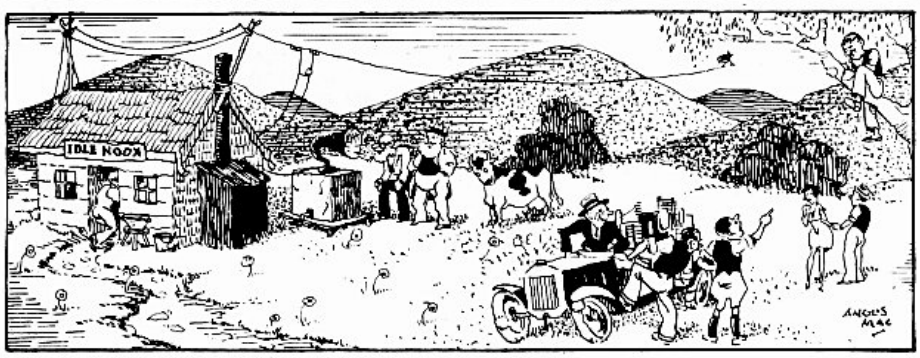
Whilst Club activities were minimal for the next 20 years, or so, regular meetings were still held which permitted the Club's existence to be continuous. Transmitting and receiving equipment remained set up and gathering dust. Capacitors dried out, and knowledge of what exactly was there became obscure.

The Club became but a mere shadow of it's former self. I can recall, upon entering the Clubroom in 1977, I felt as though I was passing through a 'time-warp'. There were things that I now know as valves, modulation transformers, carbon headphones, AR7s, and heterodyne frequency meters.

A turning point came for the Club in 1983. A few energetic enthusiasts decided to rejuvenate the Club. There was a sense of obligation to



Drawn by Herald-Sun Cartoonist, Wells, about 1930 and supplied courtesy VK3RI.



Three RIs Field Day at Selby on Kings Birthday Weekend, 1930. Supplied courtesy VK3RI.

the stalwarts that had held it together for so many years, but it was nearing the end and it would have been a pity for the oldest club in Australia just to disappear into history.

It was decided to participate in World Communications Day, 17th May 1983. The log book was not filled, but the day was well enjoyed by all who participated.

All obsolete equipment has been removed. Some was disposed of, some was auctioned to members, and some is awaiting possible restoration. There are many 78 RPM records from the 1930s era. Also many old radio and electronics magazines.

Modern equipment has now replaced the old gear. Antennas for the present are a random wire on HF, and a 10 element rotatable beam on VHF. Club nets are held on Wednesday evenings at 0900 UTC, 3.585MHz, and Sunday mornings at 2315 UTC, 52.075MHz.

By the way, the next time you feel disposed towards complaining about electrical interference, spare a thought for this radio club. Dozens of horizontal antennas are outside the Clubrooms, all connected to 1500 volt arc generators. If the operator does not acknowledge your response to a CQ, it is because your signal is less than S9, and you can't be heard! !

As the Club is a Victorian Railways Institute (VRI) affiliated club it must operate under the constitution of the VRI. The VRI provides certain facilities for members, and membership of the Club is restricted to members, or associate members of the VRI. The VRI provided the current equipment used by the Club and their assistance is much appreciated.

This brief history, especially the early parts, has been extracted from the history books belonging to the Club. The full documentation, next year, will include newspaper reports and photographs.

The Victorian Railways Institute Wireless Club would like to congratulate the WIA, the oldest radio society in the world, on reaching its 75th birthday, but we are not too much younger.

If any reader has any historic data, recollections, or memorable association with the Club in its early years, evidence in the form of a letter would be appreciated for possible inclusion in the 60 year history publication. If you can help, please contact the writer at the above address or write to Room 118, Flinders Street Station Building, 223 Flinders Street, Melbourne, Vic. 3000.

AR

DIMENSIONS AND UNITS

Greg Baker L20282
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Have you ever wondered whether an equation you were using was correct? Or tried to distinguish between different versions of what should have been the same equation? Or even tried to remember an equation when you've lent your reference books to a friend studying for their licence?

There is a method, using what are known as "dimensions", which is of help in all these cases.

All physical quantities have dimensions. The four basic dimensions are mass, written [M], length [L], time [T], and charge [Q]. The dimensions of physical quantities can usually be expressed in terms of these four basic dimensions. If they cannot, they are said to be dimensionless.

Dimensions can sometimes be deduced from units but should not be confused with them. Thus, area has dimensions of length times length, ie [L] × [L] or [L^2] regardless of the units used to measure area. The units of area are usually metres^2 but could equally well be feet^2 or miles^2. Velocity always has dimensions length/unit time [L]/[T], ie [LT^{-1}] but may variously be measured in units of metres/second, feet/second, miles/hour, etc. Frequency is usually measured in units of Hertz (cycles/second) and has dimensions [ ]/[T], ie [T^{-1}]. Note that cycles is a dimensionless quantity and is written [ ]. It cannot be expressed in terms of the four basic dimensions.

Thus, being dimensionless does not preclude a quantity from having units. As we have seen, cycles has units, ie cycles, but no dimensions. Similarly, if we remember that there are 2π radians/cycle, the constant 2π can have units rads/cycle, but again no dimensions because radians and cycles have no dimensions.

The accompanying table shows, for some commonly used quantities, the dimensions and their SI units. Some may not be intuitively obvious, but a little practice using dimensions will show they are correct. At the end of this article the dimensions of capacitance are deduced to show the rationale behind it all.

All physical equations of general applicability must be dimensionally consistent. This means that the dimensions on the left hand side of an equation must be the same as those on the right hand side. Consider the equation

$f = c/\lambda$
where f is frequency (units: Hertz),
c is the speed of an electromagnetic wave in free space (metres/second), and
λ is wavelength (metres).

Now, f has dimensions $[T^{-1}]$, c has dimensions $[LT^{-1}]$ and λ has dimensions [L]. To be dimensionally consistent c/λ must have the same dimensions as f. The dimensions of c/λ are $[LT^{-1}]/[L]$, or $[T^{-1}]$ which *is* the same as for f. Hence the equation is consistent.

Note that when multiplying (or dividing) dimensions the normal rules for manipulating algebraic symbols apply. Thus, $[M] \times [M] = [M^2]$. However, adding a length to a length (or subtracting a length from a length) always gives us a length, so [L] + [L] = [L], and similarly with the other dimensions. These rules are used extensively in what follows and come naturally with a bit of practice.

There are several ways that amateur radio operators can use this information. One is, as a quick check, on the validity of equations. As times goes by we seem to need more and more to use equations which we have not derived ourselves, perhaps cannot derive ourselves. We need to accept other people's equations on faith. However, using this method we *can* make an elementary test of validity as well as get a better insight into the underlying physical principles.

For example, suppose we wanted to use the equation
$X = 2\pi fL$
where X is inductive reactance ($[ML^2T^{-1}Q^{-2}]$, ohms)
f is frequency ($[T^{-1}]$,Hertz), and
L is inductance ($[ML^2Q^{-2}]$, henry).
Dimensions on the right hand side, remembering that 2π is dimensionless, are
$[T^{-1}]\ [ML^2Q^{-2}]$
$= [ML^2T^{-1}Q^{-2}]$
which are the dimensions of reactance. Hence the equation *is* dimensionally consistent. While this does not tell us that the equation is correct, it *does* tell us that it is *not incorrect*.

Again, suppose we wanted to use the equation
$P = E^2R$
where P is power ($[ML^2T^{-3}]$, watts),
E is voltage ($[ML^2T^{-2}Q^{-1}]$, volts), and
R is resistance ($[ML^2T^{-1}Q^{-2}]$, ohms).
Dimensions on the right hand side
$= [ML^2T^{-2}Q^{-1}]^2\ [ML^2T^{-1}Q^{-2}]$
$= [M^3L^6T^{-5}Q^{-4}]$ which are *not* the dimensions of power. The equation is not dimensionally consistent and hence is not correct. It should not be used, unless you have carefully checked it and have good reasons. While it is true on occasion that dimensionally inconsistent equations are of use, they will be experimentally derived and will have a limited range of applicability. In these cases you should make yourself aware of the limitations and stay within them.

This approach can also be useful in distinguishing between variants of the one equation. Recently a VK2 friend drew my attention to an article with the two equations

$$h = \frac{\lambda}{4}\left\{1 + 20(ND)^{5/2}\ \frac{D}{(\lambda)^{1/2}}\right\}^{-1/2}$$

and $$h = \frac{\lambda}{4}\left\{1 + 20(ND)^{5/2}\left[\frac{D}{\lambda}\right]^{-1/2\ \ 1/2}\right\}$$

There was no precise definition of the symbols, but it seemed that h was the height of a helical antenna, D the diameter of the helix, N the number of turns per unit length and λ was not specified at all but was presumably wavelength. Which formula, if either, is the one to use? One way to find out is to check for dimensional consistency. Now, h has dimensions [L], D [L], N $[L^{-1}]$ and λ [L]. The first equation has dimensions, showing both sides of the equation,

$$[L] = [L]\left\{1 + \left\{[L^{-1}][L]\right\}^{5/2}[L]/[L^{1/2}] - \right\}^{-1/2}$$
$$= [L]\left\{1 + [L^{1/2}]\right\}^{-1/2}$$

There are two things to be said. One is that this equation cannot be dimensionally consistent unless we *assume* the constant "1" has dimensions $[L^{1/2}]$. This is because we can only add like dimensions to like dimensions. If the "1" is a dimensionless constant, the equation is asking us to do something akin to adding apples to oranges. My approach here would not be to assume the "1" has dimensions $[L^{1/2}]$ but to try to check further. The other thing to say is that even if the "1" was confirmed as being a derived constant with dimension $[L^{1/2}]$, which it could be, the equation is still not dimensionally consistent because we get on the right hand side

$$[L]\ [L^{1/2}]^{-1/2} = [L^{3/4}]$$

which are not the dimensions of h. What of the other equation? It has dimensions

$$[L] = [L]\left\{1 + \left\{[L^{-1}][L]\right\}^{5/2}\left\{\frac{[L]}{[L]}\right\}^{1/2}\right\}^{-1/2}$$
$$= [L]\left\{1 + [\ ]\right\}^{1/2}$$

since [ ] raised to any power is [ ]. Then, making the more reasonable assumption that "1" has dimensions [ ] we get [L] = [L].
This equation is thus dimensionally consistent and is the equation we should use, assuming the other to be the result of a typographical error perhaps.

Thus we have a quick way to tell whether or not an equation is incorrect. This knowledge can be a useful reassurance *before* cutting expensive co-axial cable, or soldering expensive fittings, or doing any of the other numerous tasks based on calculations from equations.

Another way you can use these ideas is to jog your memory when away from your reference books. For example, suppose you want the equation for the resonant frequency of an LC circuit and remember it has something to do with the inductance L and the capacitance C. The dimensions for f are $[T^{-1}]$, L are $[ML^2Q^{-2}]$ and C are $[M^{-1}L^{-2}T^2Q^2]$. Since there is no obvious way to *add* any combination of L and C, the equation you want will probably be of the form
$f = aL^bC^d$
where a, b and d are constants. We want b and d such that $[T^{-1}] = [ML^2Q^{-2}]^b\ [M^{-1}L^{-2}T^2Q^2]^d$
$= [M^bL^{2b}Q^{-2b}]\ [M^{-d}L^{-2d}T^{2d}Q^{2d}]$
$= [M^{b-d}L^{2b-2d}T^{2d}Q^{2d-2b}]$
Since there are no M, L, or Q dimensions on the left hand side, we must choose b and d such that these all vanish from the right hand side. Equating b = d achieves this, since any quantity raised to the power 0 becomes dimensionless, eg $[M^0] = [\ ]$.
We now have $[T^{-1}] = [T^{2d}]$. Hence 2d = -1, that is d = -½, and of course b = -½ as well. Putting these back into the formula we started with,

$$f = aL^{-1/2}C^{-1/2} = a/\sqrt{LC}.$$

At this stage you may recognise the equation and remember that $a = 1/2\pi$ and $f = 1/2\pi\sqrt{LC}$. If you don't remember that $a = 1/2\pi$, you are stuck because the method cannot help with dimensionless constants.

So all right you say, I may not *remember* that C has dimensions $[M^{-1}L^{-2}T^2Q^2]$. Can it be deduced?

Remember first that capacitance is charge per volt, ie C = q/V. Intuitively we know this is true because if we were to experiment with a great heap of capacitors we would find that (i) for a constant voltage across the capacitors, the actual charge stored increases with capacitance, and (ii) for a constant charge on the capacitors, the capacitance decreases if we need a higher voltage across the capacitor to maintain that fixed charge. Now, voltage is the amount of work needed to be done moving a unit charge through an electric field, ie voltage = work/charge.

What is work, or more particularly, what are the dimensions of work? You should remember from your schooldays that work = force × distance, force = mass × acceleration, and that acceleration has dimensions length/time/time = $[LT^{-2}]$. Bringing all this together, the dimensions of force are $[M] \times [LT^{-2}] = [MLT^{-2}]$, of work therefore are $[MLT^{-2}]\ [L] = [ML^2T^{-2}]$ and thus of voltage are $[ML^2T^{-2}]/[Q] = [ML^2T^{-2}Q^{-1}]$. This then leads onto capacitance (charge/volt) as $[Q]/[ML^2T^{-2}Q^{-1}] = [M^{-1}L^{-2}T^2Q^2]$ as required.

That may look easy but it takes practice. You may not always get an answer without rushing for a reference book, but it's a lot of fun trying (yes, I am all right) and you will gain insights into the fundamental principles involved.

So there it is, a useful tool to help check on equations before their use and in some cases to derive valid equations. The method is not a panacea but it is another tool to use to come to grips with technical information.

As an exercise you might like to see whether the equations
$P = EI$
where P is power (watts), E is voltage (volts) and I is current (amps), and
$C = It/E^2$
where C is capacitance (farads), I is current (amps), t is time (seconds) and E is voltage (volts) are dimensionally consistent. You might also try to derive the equation for the time constant of an RL circuit knowing R and L are both involved.

DIMENSIONS AND UNITS OF SOME COMMONLY USED QUANTITIES

Quantity	*Dimensions*	*Units*
Capacitance	$M^{-1}L^{-2}T^2Q^2$	farad
Current	$T^{-1}Q$	ampere
Electric potential	$ML^2T^{-2}Q^{-1}$	volt
Energy	ML^2T^{-2}	joule
Frequency	T^{-1}	hertz
Inductance	ML^2Q^{-2}	henry
Permeability	MLQ^{-2}	henrys/metre
Permitivity	$M^{-1}L^{-3}T^2Q^2$	farads/metre
Power	ML^2T^{-3}	watt
Resistance, reactance, impedance	$ML^2T^{-1}Q^{-2}$	ohm
Wavelength	L	metre

AR

OH HUM! !
The world's first traffic lights exploded near Parliament Square, London, on 2nd January 1869. The lights had been erected for the benefit of Members of Parliament to be able to get to the House of Commons, but when a policeman threw the switch to turn them on, up they went!
Courtesy Angela Laurence

FM DETECTORS — HOW MUCH L and C?

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In the early days of FM the detector or "discriminator" consisted of an IF transformer with several tuned windings, a couple of diodes, and a few other components. Depending on the arrangement, the circuit was known as a Foster-Seeley discriminator, a ratio detector, perhaps a slope detector. In more recent times we have seen the evolution of a wide range of integrated circuits which contain an FM detector, usually preceded by amplifiers which may provide all the IF gain the receiver needs.

Most of these ICs are intended for use as TV sound IF systems at 4.5 or 5.5 MHz, or for broadcast FM receivers at their 10.7 MHz IF. Some, such as the CA3089E, are aimed also at the communications market and include muting circuits and outputs for signal level indicators.

On their own, none of these devices can detect FM! Essentially they respond to phase or amplitude changes with respect to the central carrier frequency, and such changes do not occur unless the circuit includes some kind of frequency sensitive element, commonly called a quadrature coil. To produce an undistorted audio output corresponding to the modulating signal, this element should have some parameter which varies in linear relationship to the frequency as it deviates over the occupied bandwidth.

REACTANCE

One such parameter is the reactance of a parallel-resonant tuned circuit. The reactance and resistance components which comprise the impedance of a parallel-resonant circuit are shown plotted against frequency in the figure, which is called a "universal selectivity curve". At the resonant frequency the reactance is zero and the resistance shows the familiar peak. At a frequency below resonance the reactance has a positive (ie inductive) peak, while at the same frequency difference above resonance there is a negative (or capacitive) peak. The region between these peaks is almost a straight line, particularly the portion symmetrical about the centre but not too close to either peak.

To be more quantitative, the reactance peaks are exactly half the resistance at resonance and occur at values of **a** (the detuning index) of ± 0.5 where **a** is defined by

$$a = Q \frac{\text{deviation from resonance } (\Delta f)}{\text{resonant frequency } (f_{res})}$$

and **Q** is the quality factor of the circuit, ie the ratio of reactance to series loss resistance **r**. Most commonly one sees **Q** given as $2\pi fL/r$, but it may equally well be expressed in terms of capacitive reactance and parallel loss resistance **R** by $Q = 2\pi fCR$.

The reactance curve is essentially linear for values of **a** between about ± 0.3, ie for linearity $Q\Delta f/f_{res}$ should not exceed 0.3. If then we define the optimum **Q** for an FM detector circuit to be that giving maximum output consistent with acceptably low distortion we have:

$$Q_{opt}\Delta f/f_{res} = 0.3 \text{ or } Q_{opt} = 0.3 f_{res}/\Delta f$$

Typically, for FM broadcasting, f_{res} is 10.7 MHz and Δf (the maximum deviation) is 75 kHz, so for broadcasting

$$Q_{opt} = \frac{0.3 \times 10700}{75} = 43$$

NARROW-BAND

But for our mobile FM communication systems the peak deviation is less than one-tenth that for broadcasting. Most repeaters are adjusted to start clipping when deviation exceeds about 7 kHz. Hence the optimum **Q** for a communications detector would be greater than 400.

Unfortunately, when we consult the application notes for our intended FM detector IC, they show typical values of L and C for a broadcast detector, but seldom indicate how they should be changed for use on narrow band systems. They commonly specify an unloaded coil **Q** (Q_u) of 50, which when shunted by the internal resistance between the relevant IC terminals drops to around the necessary 40 or so.

But for communications we want a loaded **Q** of 400 or more. We can't get it! No practical coil is that good. We can use a crystal, but then we may find the bandwidth is too narrow and have to experiment further. Besides, crystals are much more expensive than coils and capacitors, so the best we can do is to use a reasonably high **Q** circuit having **L/C** such that the circuit will not be too heavily loaded by the IC resistance. This can be determined as follows.

We noted before that $Q = 2\pi fCR$. If **R** is not only the parallel loss resistance of the coil, but also includes the IC resistance, this will give the working or loaded **Q**. A reasonable compromise is that $R_{ic} = 2R_Q$ where R_Q is the coil's own parallel loss resistance. So the effective parallel resistance becomes $R_{ic}/3$.

$$\text{Now } R_Q = \frac{Q_u}{2\pi fC} = \frac{R_{ic}}{2}$$

So

$$\frac{Q_u}{\pi fC} = R_{ic} \text{ or } C = \frac{Q_u}{\pi f R_{ic}}$$

This will then give an effective **Q** of ⅔ the coil unloaded **Q**. For the usual type of slug-tuned coil at 10.7 MHz a **Q** of 100 is a reasonable expectation, but what is R_{ic}? A figure of 3K is given in the data sheets for the LM373 and LM374, but for other IC types such as the CA3065, 3075, 3089 and 3189 it may be inferred from other data to be about 6K. For these more widely-used types we may therefore calculate that at 10.7 MHz

$$C = \frac{100 \times 10^3}{10.7\pi \times 6} = 500 \text{ pF (approx)}$$

And the inductance to resonate with this at 10.7 MHz works out to be about 0.44 microhenries.

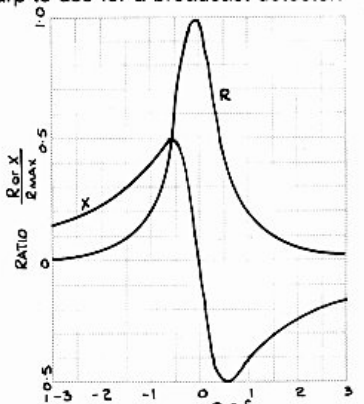
COIL DESIGN

For a "home-brew" design the most appropriate coil former is the Neosid moulded type of 3/16 inch (approx 5 mm) outside diameter housed in an aluminium can ½ inch (12.7 mm) square. Small iron dust cups are available which fit over the top of the winding, plus a similar ring below it, so that there is an almost fully-closed magnetic circuit around it, which is completed by the fine-thread ferrite slug inside the former. The near-closed magnetic circuit raises the **Q** by needing less turns for a given inductance, thereby reducing copper loss. There is a choice of slugs, the higher-frequency F29 or the low-frequency F16. At 10.7 MHz it makes little difference which is used.

Bases having 6 pins are part of the Neosid range. The former, as a first step, is glued into the base with a drop of epoxy cement. An iron dust ring is then slid down to the bottom of the former. The winding itself is about 9 turns of 28 AWG enamel and cotton covered wire wound by hand into a criss-cross pie formation above the ring, and held together by a drop of melted beeswax before the wire end is released. The two ends of the coil emerge over the ring, and are soldered to two of the base pins. The cup can now be fitted and the whole assembly mounted in the can and secured by bent-in tabs at the can edge.

The capacitor should be a stable high-Q type, preferably silver mica, but most of the plastic dielectric types are acceptable. Ceramics of low enough temperature coefficient will probably be rather large in physical size but may also be used. NP0 for preference, perhaps N100, but larger coefficients such as the popular N750 are not stable enough.

If you have built an FM receiver using an IC such as those mentioned, and for lack of any better information used the quadrature coil specified for FM broadcast or TV sound, you have probably found it produces much less audio than desired on narrow-band FM. Try the values suggested above and hear the difference. There is just one snag. It will now be too sharp to use for a broadcast detector!



CONCLUSIONS

From all the foregoing we may reach three conclusions as regards an IF of 10.7 MHz:

1 *For broadcast FM the loaded Q of the quadrature coil should not exceed about 40 or modulation peaks will be distorted.*
2 *For narrow-band FM is will be impossible to achieve a Q high enough to give distortion, unless perhaps a crystal is used instead of an LC circuit.*

3 *To obtain maximum output from practical coils the L/C ratio must be such that the IC shunt resistance introduces relatively little extra loss to that of the coil. In practice this means C must be from several hundred to perhaps 1000 pF.*

AR

To begin, select Auto 100,10 and enter on the first line that appears, say, a contest number, the date, signal strength, name, QTH, time, etc. You can select any number and it may be an advantage to chose other line numbers, say 5000 for VK5, 6000 for VK6 and so on. For example: *00100 VK5AHK: Your No 045 sig 5&9: My No 004 sig 5&8: 23.6.85: 0900: Karl*

Using the 'Auto' command, the line numbers appear automatically in any sequence as desired and as 184 characters can be stored on each line, there is ample space for log keeping, or for any other purposes such as, addresses and telephone numbers of friends and relatives. By the use of the Global Search command 'GX' any line of information can be retrieved instantly by asking for any character appearing on that line.

If the GX command GX/K/K/ is given for instance, then any line with a 'K' in it will be retrieved and displayed, one at a time, as the RETURN key is pressed.

To retrieve a particular line, you must choose not one character, but two or more, such as a name or call sign, or something specific in that line. Of course, if you want to recall all the South Australian call signs, ie VK5s, then the GX command GX/VK5/VK5/ should be given and all lines of information with VK5 stations would be recalled and displayed, one at a time, as the RETURN key is pressed.

A GX command, GX/JACK/JACK/ will cause all lines of information containing 'Jack' to be displayed.

Figure 1 displays a dummy list of contacts, as they may appear in a contest, and printed out in selected lines using the Global Search command. The first one shows selection by name, the second by date, and the third by number. Remember, this is done on this particular computer withour a programme but, by using the Global Search command facility.

The normal use of the GX command is for changing variables or characters in a programme, and the form, GX/KARL/TOM/ is used. Here Karl will be replaced with Tom as each Karl is searched for and displayed when the period '.' is pressed. However, no change occurs if the RETURN only is pressed.

For our application of the GX command, the period '.' is not used and therefore nothing will be lost, or changed, from the information on each line when being retrieved.

It is not necessary to enter two commands in the GX statement for our purpose, the form GX/KARL// is sufficient to retrieve and display a line with the name Karl in it.

On a 16k Bee, about 300 to 400 lines of information can be stored before running out of memory, but it depends on the amount of information included on each line.

The information can be saved in the usual way, either with cassettes or disks, when you run out of memory space.

I am not a contest operator and do not claim that the arrangement I have given, for contest log keeping, is the best, so I leave this for the individual to judge.

Happy Contest Beelogging!

AR

Hello, Hello!
On 28th January 1878, the worlds first switchboard was installed in Connecticut. Instead of answering the telephone by saying Hello, people said Ahoy! Ahoy!
Courtesy Angela Laurence.

Recently there have been some very simple, and interesting programnmes for the VIC computers, particularly for log and contest keeping, and I thought AR readers would be interested in a Microbee system which does not need a programme, yet it can retrieve and display any selected log as required.

Karl Saville VK5AHK
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COMPUTER LOG PROGRAMME FOR A MICROBEE

```
00100 #1 VK5AHK:1230:YOUR #.012 RST 5&8:MY #.067:RST 5&9:2.1.85:KARL:TEN-TEC
00110 #2 VK5XT: 1240:YOUR #.534 RST 5&7:MY #.068 RST 5&9:2.2.85:JOHN:ICOM
00120 #3 VK5AJN:1250:YOUR #.643 RST 5&3:MY #.069 RST 5&7:2.3.85:REG:TS 500
00130 #4 VK5ACJ:1255:YOUR #.231 RST 5&9:MY #.070 RST 5&9:2.4.85:CLIFF:FT101
00140 #5 VK5UY:1310:YOUR #.102 RST 5&3:MY #.071 RST 5&5:2.5.85:RAY:TEN-TEC
00150 #6 VK5ABW:1320:YOUR #.222 RST 5&9:MY #.072 RST 5&8:2.6.85:BARRY:TS520
00160 #7 VK4ADK:1324:YOUR #.054 RST 5&6:MY #.073 RST 5&8:2.7.85.DAVE:FT107
00170 #8 VK3HT 1323:YOUR #.204 RST 5&9+:MY #.074 RST 5&9+:2.8.85:JACK:COLLINS
```

Figure 1.

```
Ready
>
>GX/JACK//

00170 #8 VK3HT 1323:YOUR #.204 RST 5&9+:MY #.074 RST 5&9+:2.8.85
:JACK:COLLINS



Ready
>GX/2.5.85//

00140 #5 VK5UY:1310:YOUR #.102 RST 5&3:MY #.071 RST 5&5:2.5.85:R
AY:TEN-TEC



Ready
>GX/VK5ACJ//

00130 #4 VK5ACJ:1255:YOUR #.231 RST 5&9:MY #.070 RST 5&9:2.4.85:
CLIFF:FT101



Ready
>
>GX/#8//

00170 #8 VK3HT 1323:YOUR #.204 RST 5&9+:MY #.074 RST 5&9+:2.8.85
:JACK:COLLINS
```

IF YOU CAN'T BEAT THEM — JOIN THEM!

Being the mother of an amateur has certain disadvantages, but when mother is an amateur too — well, it's not so bad, and such things, as leaving tools lying on the dining-room table, and spilling acid on the carpet pass almost without notice!

Mrs E L Hutchins VK3HM, is the mother of a grown-up family, which includes VK3HL, who has been on the air for many years. About two years ago, Mrs Hutchins, having learned the code, used to copy stations on the receiver in VK3HL's shack. Under her son's tuition, Mrs Hutchins sat for, and attained the AOCP, thus becoming one of the first lady transmitters in Australia.

She has the distinction of being the only woman in Australia to have worked two-way communication stations in all continents. This performance was achieved in less than four months from the time VK3HM first went on-air, and makes her eligible for the WAC Club, whose world-wide membership numbers less than 300. Most operating is on the 20-metre band.

VK3HM has all the multitudinary duties of a country home to attend to, but she usually manages to get on the air between 3 and 4pm, and again from about 8.30 in the evening. She has been known to still be on-air at dawn, chasing the elusive DX.

Condensed from Wireless Weekly, 3rd April 1931

MORSE CODE ON THE VZ200

A previous article described an adaptor to operate RTTY on the VZ200 computer. The adapter has now been modified to include Morse code.

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Expansion of the programme resident in the EPROM and minor changes to the wiring, have expanded the VZ200 RTTY adaptor to include encoding and decoding of Morse code. Morse speed can be varied over a range of approximately five to 35 words per minute. Resident messages, buffer storage and split screen operation, all used on RTTY, are also available for Morse operation.

HARDWARE CHANGES

To interface for Morse code, the 8251 USART functions DSR and DTR are used as one bit input and output ports respectively. DSR is simply wired in parallel with the existing data input (RXD). DTR is wired via a spare gate (V6-2), which is used to key the tone output from gate (U5-3). The circuit changes are illustrated in Figure 1.

For Morse code, the output tone is set at 2125Hz by the software and this can be used to feed the speech input of a transmitter. In a single side-band transmitter, CW transmission (A1) is generated and on a transmitter where carrier is not suppressed, MCM transmission (A2 or F2) is generated. Of course the latter is only permissible above 52MHz.

MORSE FORMAT

Morse format is based on the following:

Dash = three dots length
Space between dot or dash elements = one dot length
Space between characters = three dots length
Space between words = seven dots length

Speed is controlled by a selection code of one to eight and for the two lowest speeds (below 10 WPM), the spacing is increased to the following:
Space between characters = five dots length
Space between words = 13 dots length

There are a number of special Morse characters which are not available on the keyboard and not available as printed characters. These have been equated to available characters as follows:
Error = asterisk (*)
Double dash = dash (—)
Wait = plus (+)
Start of message = less than (<)
End of message = equals (=)
End of work = at (@)

Error is transmitted as six dots, instead of the standard eight, because six elements per Morse character is the maximum the system can process.

Morse characters are generated from a look-up table, one byte per character. Bits two to seven are used to store the individual elements of a character, zero representing no element or a dot and one representing a dash. Elements are justified left, with the last element sent, always in bit seven. The numeric value formed by this is added to the number of elements in the character and the sum is the value stored in the look-up table. For up to five element characters, it is an easy matter to extract the number of elements from bits zero to two and the dots and dashes elements from bits three to seven. For six element characters, there is an overlap on bit 2 and summing causes bit carry on four of these (parenthesis, comma, colon, and semi-colon). To detect these is a bit tricky. The logic is to look for a one in either bits four or five and binary 010 in bits zero to two. If this logic is satisfied, the number of elements is assumed to be six and six is subtracted from the byte value to obtain the element format in bits two to seven.

Some examples of look-up table coding are shown in Figure 2.

OPERATION

Morse can be sent on line, direct from the keyboard and characters are encoded at the selected speed by the software. In this method of operation, character and word spacing are

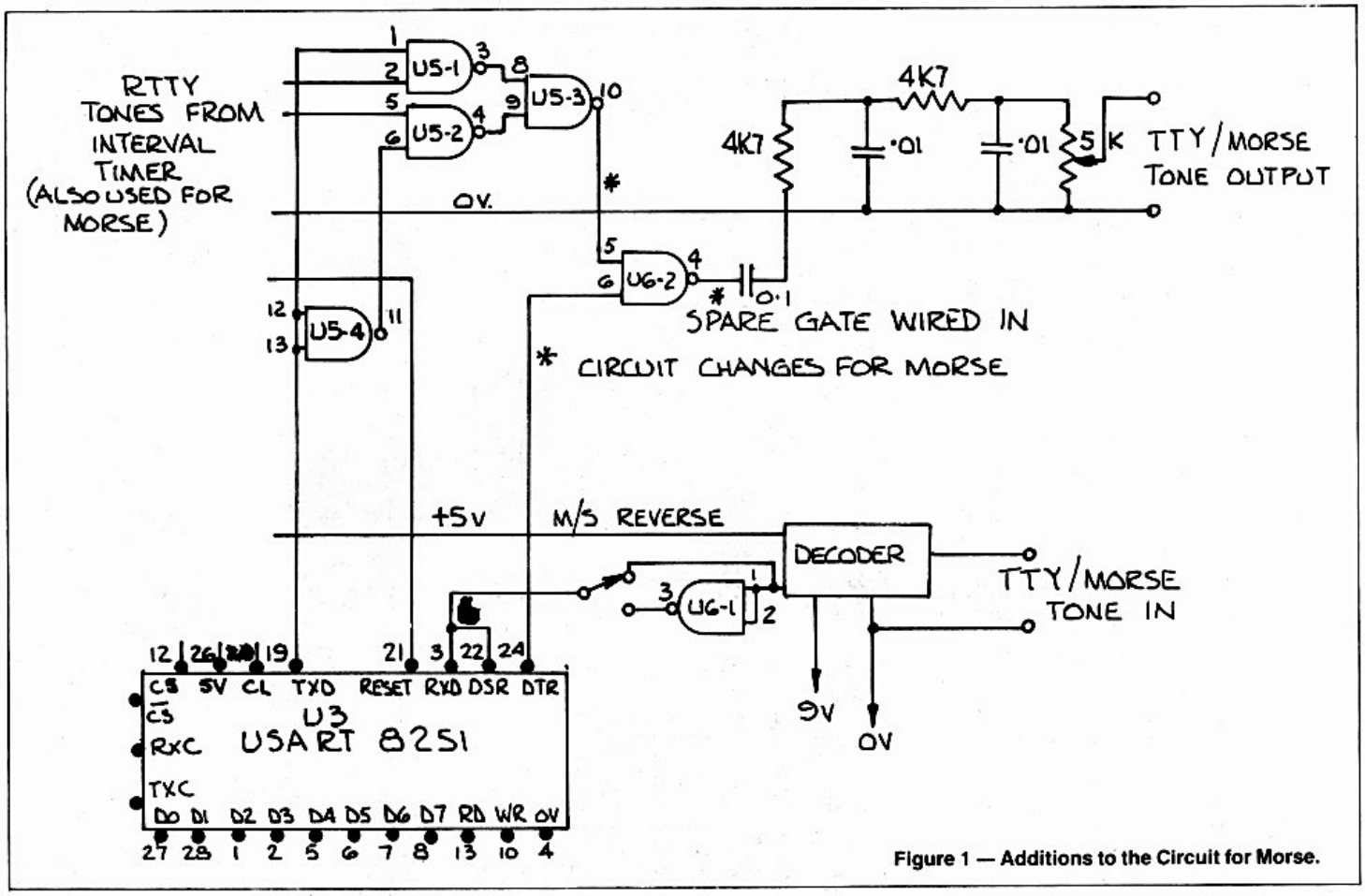


Figure 1 — Additions to the Circuit for Morse.

Figure 2 — Examples of Table Coding for Morse.

MORSE CODE	BINARY VALUE (BIT No)	HEX VALUE
	76543210	
Letter B — . . .	00010100	14
	code 4 elements	
Interrogation (?) . . — — . .	00110000	30
	code + 110	6
	6 elements = 00110110	36
Comma (,) — — . . — —	11001100	CC
	code + 110	6
	6 elements = 11010010	D2
	Carry of Bit 2 into Bits 3 & 4	

determined by the time taken to move from one key to the next and, it seems to the writer, that a lot of practice would be needed to control the spacing correctly.

Morse is better sent by releasing the message from a pre-loaded buffer so that character and word spacing is accurately controlled by the computer. Using this method of operation, when communicating with another station, it is necessary to load the buffer at the same time as the other station is being received. This is common practice with RTTY operators using computers with split screen displays.

For RTTY, characters are encoded and decoded by the 8251 USART and the device is addressed by the computer for a very small proportion of the time. The rest of the time is available for other purposes including accessing the keyboard and loading the buffer, hence there is no problem in preparing the signal for transmission whilst the received signal is being decoded.

For Morse code, characters are encoded and decoded by timing loops called in by the main programme routine and while this is going on, access to the keyboard to load the buffer is denied. The obvious answer to the problem is to access the keyboard via an interrupt, however to make things difficult, the Z80 interrupt is already used by the VZ200 operating system. This calls an interrupt every 20 milliseconds on video vertical retrace.

Steve Onley described a method to make use of this 20 milli-second interrupt in Electronics Today International (ETI), May 1985. Your own interrupt is placed in series with that of the operating system so that it too can interrupt the main programme loop every 20 milli-seconds. The method described has been adopted for accessing the keyboard and loading the buffer in Morse operation.

Owing to peculiarities of the VZ200 system, keyboard access using this interrupt inhibits repetitive generation of a character, that is, you have to press the key each time a character is to be generated. This is not such a bad thing as it stops generation of more than one character if the key is accidentally pressed too long. The reason for the peculiarity is not clear as we do not have access to information on the VZ200 operating system.

The interrupt system works very well for loading the buffer, but a problem was found in attempting to generate Morse characters this way in real time. Because of the peculiarity discussed, a key pressed too soon, before the previous character is finished being transmitted, fails to generate a character and locks in this condition until the key is released and pressed again at the end of the previous character. Because of this problem, the interrupt is only used for loading the buffer and in all other modes of operation, the keyboard is accessed from the main programme loop. Using this method of access, the key can be kept pressed and the new character is sent, following a three dot length space, at the end of the previous character.

MEMORY

The combined RTTY and Morse programme package fully fills the 4k byte EPROM. A certain amount of programme trimming and rearrangement had to be carried out to fit it in. The programme is loaded in memory COO3H to CFF9H. RAM space used is 8000H to 8900H.

Based on information given by Jim Rowe in ETI, July 1985, the memory allocation should be suitable for both the VZ300 and VZ200 computers. A VZ300 has not been available to check it out, but the adaptor is expected to also work on the VZ300. There appears to be a change in clock frequency in the VZ300 from 3.580 to 3.540MHz. This will cause a shift in Baud rate and tone frequencies, but insufficient to be of significance.

CONCLUSION

The unit works very well on both RTTY and Morse code. The Morse decodes over a wide tolerance in reference to the speed selected. The writer was surprised how well it manages to decode hand sent Morse in which timing is not precisely defined. Noise interference is reduced by feeding the input signal via the RTTY decoder filters, but it does not perform as well as the human ear in separating Morse from noise. No doubt this could be improved if frequency shift keying were used.

Morse sent from the buffer sounds copperplate, as one would expect fully controlled by the computer. On line from the keyboard, the writer found it difficult to maintain constant character spacing, but this is probably a matter of practice on the keyboard. **AR**

To convert a CB 'Station Master' to 80 metres for minimum dollars, you will need a piece of PVC pipe, about 10m of copper wire and a tube of 'Araldite'.

Portable Antenna for Eighty Metres

Keith Rehe VK4KAW
7 Guardsman Avenue, Alexandra Hills, Qld. 4161

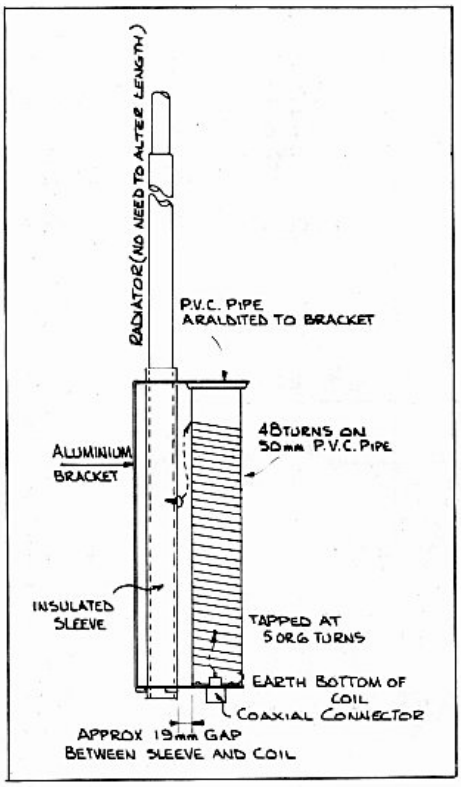
Remove the original coil by drilling out the pop rivets that hold it and then wind a new coil on the PVC pipe former.

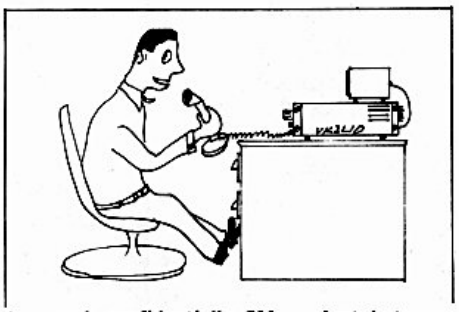
The completed antenna resonated 1:1 on 3.545MHz and was 1.2:1 on 3.620. The radiator breaks down to about four feet (1m), and can be stored in a caravan or car boot with ease.

It can be mounted at ground level or on the car or caravan, ensuring you keep the coil clear of metal surfaces.

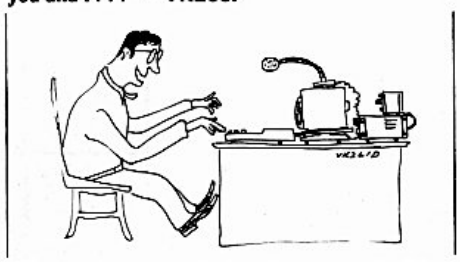
Technical Editor's Note:
Some adjustment of the number of turns on the coil, the tapping point, or the length of the radiator, may be needed. These will be dependant on the actual materials used to make the coil. The wire used for the coil should have a diameter in the region of 1.5mm, in order to minimise losses.

AR





'. . . and; confidentially OM — Just between you and I . . .' — VK2COP



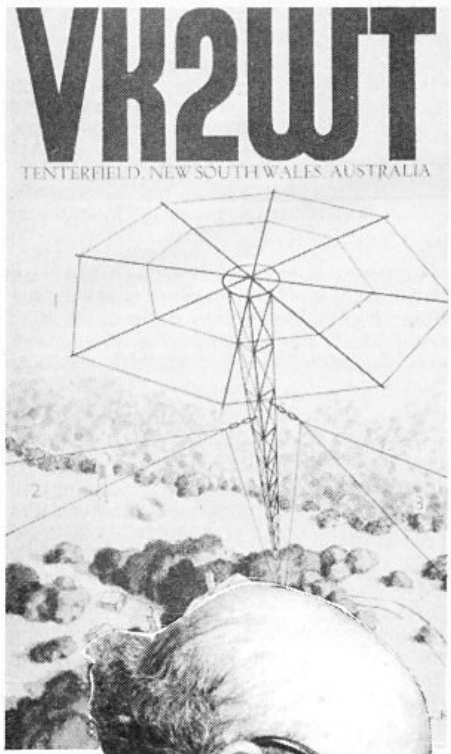
"My computer says it doesn't want to 'talk' to *your* computer, OM!" — VK2COP.

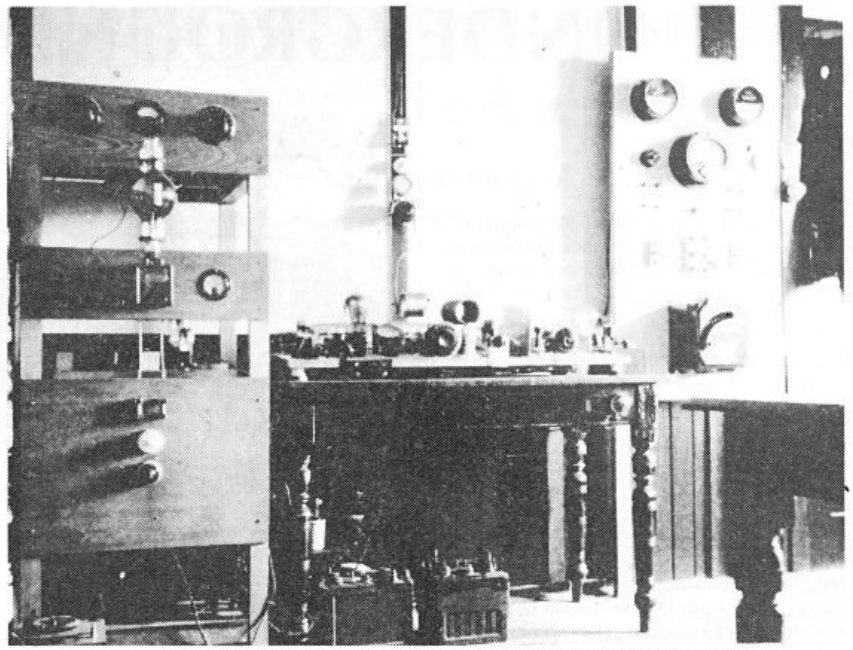
"QSL Direct?! Listen OM — I haven't paid off the rig yet!" — VK2COP.

TENTERFIELD OLD TIMER

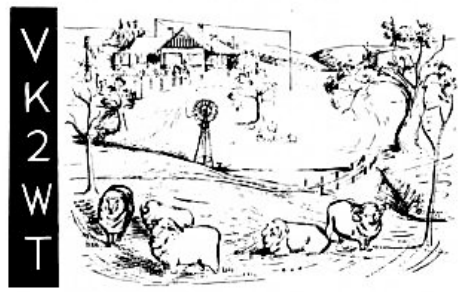
Recently, Russell Watt VK2WT was featured in the TENTERFIELD STAR, explaining the benefits of a lifetime hobby in amateur radio.

Russell was granted a Certificate of Proficiency in Radio-Telegraphy in 1925, and over the years, has kept many 'bits and pieces' from the early days. He was pleased to discover he still had a valve of the type used in the radio receiver on the cover of Amateur Radio, May 1985. (See photo 1).





—— An early photograph of Russell's 'shack'. Note the batteries under the table.



Russell's QSL cards, through the years.

Russell, aged 21, poses for the identification photograph on the back of his Certificate.

Photographs courtesy Tenterfield Star

Form 14. Certificate No. 181

COMMONWEALTH OF AUSTRALIA.

AMATEUR OPERATOR'S
Certificate of Proficiency in Radio-Telegraphy

GRANTED BY THE POSTMASTER-GENERAL

This is to certify that, under the provisions of the Regulations of the *Wireless Telegraphy Act* 1905-1919,

Mr. Charles Russell Watt

has been examined in Radio-Telegraphy and has passed in :

(a) transmitting and receiving (by sound) Morse signals at a speed of not less than twelve words a minute ;

(b) the adjustment and operation of low-powered apparatus and knowledge of its working ; and

(c) knowledge of principal Abbreviations and Regulations laid down by the International Radio-Telegraph Convention ;

and is thus qualified to operate an Experimental Station in accordance with the above-mentioned Regulations.

It is also certified hereby that the holder has made a legal declaration that he will preserve the secrecy of commercial and defence wireless communications.

Chief Manager, Telegraphs and Wireless, Postmaster-General's Department.

Certifying Officer. Date 21. 9. 1925

This Certificate does not authorize the holder to operate a ship, coast, or broadcasting station.

Date

Signature of holder C Russell Watt

Date and place of birth 17th May 1904 Inverell

Fee for Issue, 2 6

Russell's Certificate.

UNDERGROUND WAVES

Special thanks to Bob Staden VK4ZSK, Wolf Getto, Marian Dent and the PR Department of Mount Isa Mines for their help in compiling this article.

Steve Stephens VK4KHQ
PO Box 2154, Mt Isa, Qld. 4825

This article is an insight to underground communications in a deep mine.

Mount Isa is situated in north west Queensland, at 139 degrees 30 minutes east and 20 degrees 45 minutes south. The city has a population of 25,500 and 32 of these are licenced radio amateurs.

The mine itself, employs 4860 people and is the biggest producer of copper in Australia and the biggest combined silver, lead, zinc mine in the world. It is also the operator of, what could be, the longest antenna in the world. The mine's surface area covers more than 10 square kilometres, and underground, there is over 460 kilometres of road and 200 kilometres of rail tracks.

To control this organisation, there are 11 radio networks including, one low frequency, four HF, three VHF low band, four VHF high band and four UHF channels. The surface fleet consists of more than 400 vehicles from quarter tonne utilities to 90 tonne off-highway dump trucks. About 60 percent of these vehicles are co-ordinated by full time base station radio operators within the transport and warehouse sections.

Mount Isa mine looking north. The lease is west of the railway line, city to the right.

There are three major shafts, which convey men and supplies to the underground workings and these use high band VHF for voice communications between the cage (which carries the gear), and the winder driver, who operates the massive winding motors in the headframe. The R62 shaft main cage travels at more than 40 kph and to avoid accidents, several continuous tone oscillators monitor the failsafe mechanisms and trigger alarms or trip the drive system, in the event of a failure. Induction coils, coupled to the 44mm diameter steel winder ropes transmit data in the 125-180kHz LF band, to indicate such things as cage door positions, and other proximity switch positions to the winder driver. He also has an electric calling system which enables men on any of the 19 main levels, which are 58 metres apart, to call the main or auxiliary cages.

Until recently, tourists were taken on underground tours and upon arriving at a level, were driven by modified diesel four wheel drive,

A supervisor in a modified four wheel drive vehicle underground.

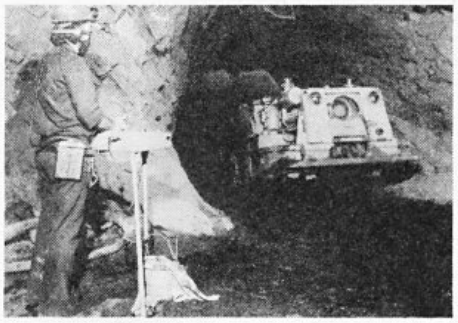
to see the mine in action. Unfortunately, these tours were stopped due to essential cost cutting measures brought on by low metal prices and several other outside factors.

Ore is drilled and blasted, then transported by 10 metre long, 20 tonne load-haul-dump units in 4.7 cubic metre mouthfuls to tipples, which are chutes allowing the ore to flow down to the next major transport drive below the production level. Two of these megaliths have been converted for remote use by UHF radio control for operation in hazardous areas. They use 14 channel, FSK modulated, pedestal mounted transmitters, which give full control of direction, speed and bucket operation, enabling the operator to 'muck out' the bottom of stopes, where there is a danger of sudden rock falls. When the unit is brought back to a safe area, the remote control gear is bypassed and the unit is then driven normally to discharge the ore in the tipple. Many underground vehicles are fitted with VHF low band transceivers and communicate via the longest antenna on earth . . . 15,000 metres of Radiax, mounted overhead in major drives and crosscuts. Radiax is similar in construction to low loss, rigid coaxial cable except, the crests of the outer, corrugated copper conductor has gaps machined out which allows some RF radiation along its entire length. This system allows both simplex and duplex two-way communication between vehicles, supervisors, haulage trains and the central train control room.

Small electric locomotives, called Mules, haul gear around the levels and their drivers use Motorola hand-helds with rubber antennas. Considering the environment and general operating conditions, the radios are amazingly forgiving. I wouldn't expect my trusty amateur hand-held to last a full shift at the mercy of the mine. Because of severe conditions existing underground, all radios have to be virtually waterproof and withstand prolonged high temperatures and vibration, not to mention the odd falling rock.

Generally, once you travel more than 50 metres from the Radiax, very little useful reflection occurs and communications are rapidly lost. Recently, tests have been carried out using UHF hand-helds and similar radios. This is just one of the avenues which the radio section personnel are exploring.

There are three main rail haulage levels and a typical example has one control room operator and four trains, each with two 20 tonne electric



A radio-controlled load-haul-dump unit 'mucking out' a stope.

locomotives and 15 trucks, hauling 250 tonnes of ore every 15 minutes. Ore discharged from the trucks flows to the crushers on level 20, 1055 metres below the surface. After primary and secondary crushing, the ore is hoisted by 30 tonne skips and conveyed to the storage bins at the surface where it is processed.

Isa mine is actually two separate mines, one producing copper and the other lead, silver and zinc. The two ore streams are mined, hauled, crushed, hoisted and concentrated separately and conveyed to their respective smelters, which are almost side by side. In the copper smelter, there are two, 80 tonne overhead cranes above the converters and another two over the anode furnaces. The crane chasers and supervisors guide the crane drivers with one watt, VHF hand-helds, during transfer operations.

The mine has its own weather station, which tracks daily meteorological balloon flights. These have UHF radio Sonde equipment attached and transmit atmospheric pressure, temperature and moisture content telemetry. The balloon is tracked until it bursts at about 50,000 feet (15,250 m), which is above the tropopause and international flight paths. There are also three sulphur dioxide monitors around the city with UHF telemetry transmitters, two of which are solar powered and considered very reliable, after many years of operation. Information from these, and 10 hard-wired monitor stations, feed a computer which provides a summary of air quality control and updates every five minutes.

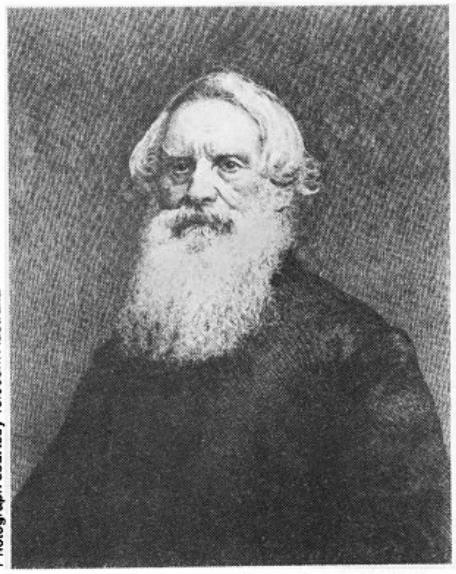
By now, members can imagine the size of the annual licence renewal bill, which is in excess of $18,000!

In March 1978, the new 270 metre lead smelter stack was completed and the local amateur group drooled as they imagined what 2 metres coverage would be like from the top. The transport frequency radio was remote linked to the top of the stack but, due to limited access and lightening strikes, it is to be relocated. I believe it is the highest VHF antenna in the southern hemisphere. Unfortunately, we still cannot receive VK4RMI in Mount Isa, either.

There are more than 250 radios used on the lease including paging systems, railway marshalling, power station operation, fire, ambulance and security, plus several other small, stand-alone systems, so living with a scanner is an entertaining experience, 24 hours a day.

SAMUEL FINLEY BREESE MORSE AND HIS CODE

The first message transmitted over a telegraph line between Baltimore and Washington, in the United States, using Morse code, was "What has God wrought?"



Photograph courtesy Telecom Australia

There has been other telegraph systems before Morse, in particular the Englishman, Charles Wheatstone, developed a system using the deflections of a needle, which was used in railway signalling.

Both Wheatstone and Morse were indebted for their basic ideas to the American, Joseph Henry, who did not patent his inventions. There were two factors that made Morse's system different and led to its acceptance universally.

Firstly, Morse's ability to lobby the US Congress and convince them to pay for the construction of the first commercial telegraph line, and secondly the simplicity and ease of his code.

Skilled telegraphists were able to send messages at up to 30 words per minute.

Morse's basic telegraph system was extremely simple, with the telegraphists opening or closing a switch (key) to send electricity from a battery along the telegraph line. The return path for the current was through the ground. At the receiving end, the pulses of current operated a pen, which marked a strip of paper, later known as 'Ticker Tape', when current was present.

The, telegraphists found they could spell out the message just listening to the sound the pen made, and eventually the marker was replaced by a mechanism to amplify the sound. The problem was, how to use these pulses of electric current to represent the letters of the alphabet and to spell out a message.

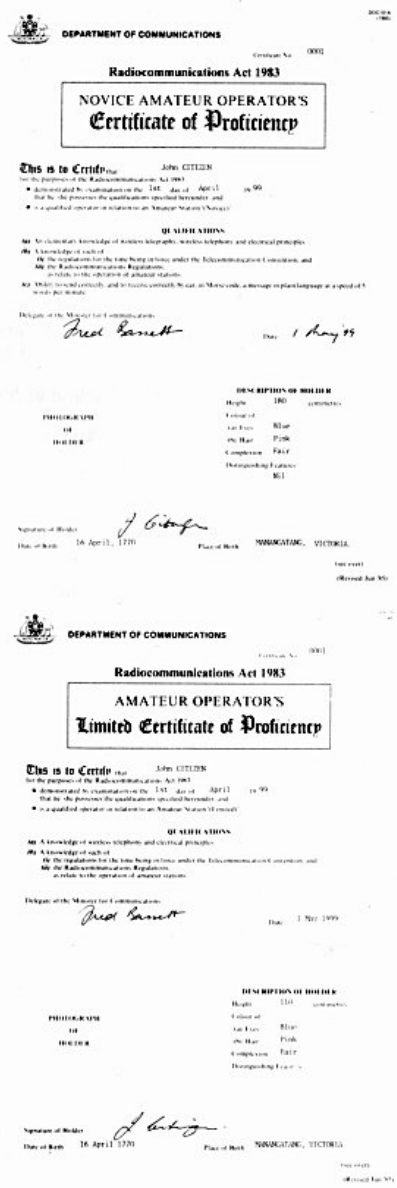
The heart of Morse's invention was his decision to use two different kinds of electrical pulse, one short and one long, a dot and a dash. By combining these two kinds of pulses, it was possible to represent every letter of the alphabet by a code of four pulses or less.

Morse gave the letters which were most frequently used the shortest codes. In this way, the number of pulses sent to communicate an average sentence in English, could be sent to a minimum. This is why the letter E, the most commonly used in the English language, was given a single dot.

The most common letter T got a single dash. Less common letters were made combinations of dots and dashes. Numerals and punctuation marks were made up of combinations of five or six pulses respectively. Morse also set the rules that a dash was to last as long as three dots, a space as long as one dot was to be left between the pulses, making up the same letter. He also ruled a space as long as one dash was to be left between different letters and a space as long as five dots was left between different words.

AR

Certificates Issued by DOC



DEPARTMENT OF COMMUNICATIONS

Radiocommunications Act 1983

NOVICE AMATEUR OPERATOR'S
Certificate of Proficiency

This is to Certify that John CITIZEN

QUALIFICATIONS

DESCRIPTION OF HOLDER

PHOTOGRAPH OF HOLDER

Signature of Holder

Date of Birth 16 April 1970 Place of Birth MANANGATANG, VICTORIA

DEPARTMENT OF COMMUNICATIONS

Radiocommunications Act 1983

AMATEUR OPERATOR'S
Limited Certificate of Proficiency

This is to Certify that John CITIZEN

QUALIFICATIONS

DESCRIPTION OF HOLDER

PHOTOGRAPH OF HOLDER

Signature of Holder

Date of Birth 16 April 1970 Place of Birth MANANGATANG, VICTORIA

Supplied by Jim Linton VK3PC

DIGITAL TO REPLACE MORSE IN MARITIME DISTRESS COMMUNICATIONS

Jim Linton VK3PC
4 Ansett Cresent, Forest Hill, Vic. 3131.

Since early this century, ships have used Morse Code for Distress signals but, that will end when computer-age technology is introduced in the next decade.

The International Maritime Organisation (IMO) plans to adopt automatic digital systems. Rod Harris, a senior radio communications engineer with the Department of Transport, said it was planned to replace Morse code under a world-wide review called 'The Future Global Maritime Distress and Safety System'.

Tentatively the new system will be fully operational in 1996, with a phase-in period beginning about 1990.

The new system basically means that someone will simply press the panic button to automatically send a distress call, including the ship's exact position. It would no longer be necessary for the radio operator to pound a Morse key to send out SOS. Operators would also be relieved from being by the radio 24 hours a day, in case a distress call is heard, as receivers will automatically scan a number of distress frequencies.

Maritime communications is one of the last to replace Morse with more modern systems.

Samuel Morse developed the code in 1832 and publicly demonstrated that messages could be sent electrically in 1844, when he opened a telegraph line joining Baltimore and Washington. The code rapidly gained use as telegraphs spanned continents, crossed ocean floors and wireless telegraphy was developed.

Australia's first telegraph linked Melbourne with nearby Williamstown port in 1854. Progressively, it linked the Australian continent, east with west and Adelaide with Darwin via the overland telegraph line.

Australia was first linked with the outside world via a cable between Darwin and Java in 1872, then to New Zealand in 1876. Other cables followed later.

Wireless telegraphy communication with England began in 1918 . . . 12 years earlier, Tasmania was

linked with the mainland by wireless Morse.

It took about 100 years for the teleprinter to make Morse telegraph redundant, and its use by wireless telegraphy has been steadily declining throughout the world.

The Overseas Telecommunications Commission of Australia (OTC), closed its last Morse telegram link, with Lord Howe Island, in 1975. Radio teleprinter, improved high frequency radio systems, better submarine cables and satellites have all made Morse obsolete for OTC telegram operations. However, OTC, through its coastal radio service for ships at sea, still uses the code.

Harold Jones, of Sydney Radio VIS, said that since the advent of the telex on radio had come into its own in the last decade, there has been a steady decline in Morse. He said there were a greater number of ships each year being fitted with telex, which is quicker and cheaper, and gives vessels direct contact with their offices.

Other factors leading to the reduction in Morse are better radio-telephone facilities, satellites, and also fewer ships, particularly liners, Mr Jones said.

Commenting on its future, the veteran of more than 30 years said: "It must go eventually, just how soon, I couldn't say. As satellite communication becomes cheaper and more accessible to ships, the decline will probably happen very quickly".

Retired principal of the Marconi School of Wireless (Sydney), Cec Bardwell said the hey-day of Morse was from the early 1930s, through World War 2 and the 1940s.

Cec spent 40 years involved in teaching Morse at the school, and remembers the many areas which no longer use it.

Morse communication between railway stations ended in the early 1930s, police used it to contact their patrol cars before the war and in the post war era, police intra-state and interstate communications were in Morse, Mr Bardwell recalled.

Weather reports were once gathered in Morse, and aviation communications used Morse until 1954. The Postmaster General's Department had Morse in every post office, but replaced it with teleprinters from about 1959, said Mr Bardwell.

A group of mainly former postmasters and telegraphists, called the Morsecodians, was formed in 1974 and holds annual reunions each October in Sydney. Their president, Gordon Hill said the telegram and mail were the main communication in Australia once, but that changed from the 1960s with the improvement in telephone services.

Remembering the Morse telegram days he said: "Telegraphists at the Sydney GPO handled large volumes of traffic daily and up to 400 operators, a shift, would sit by their sounders. The day Morse code went out of the post office was, in my opinion, the day the post office died."

The hobby of amateur radio was certain to be the last bastion of Morse code, although it had also seen a decline in Morse due to a number of factors. A leading Morse operator was Austine Henry VK3YL, who has been on air for 55 years, almost exclusively using the code.

"It is a part of my life, and it was only in recent years that I reluctantly used a microphone," said Mrs Henry.

Morse code will hopefully always be a part of amateur radio and those in the hobby not using it were missing out on something, she said.

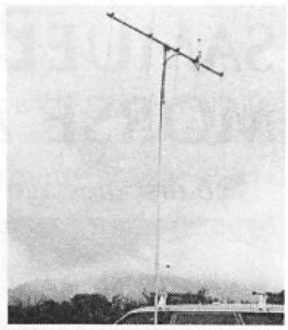
"Some radio amateurs, after passing a Morse code test, give it up the minute their ticket arrives in the post. I can not understand it", said Mrs Henry.

AR

Did you know?
An amateur radio satellite, designed and built by members of the Melbourne University Astronautical Society was launched on 23rd January 1970, by NASA.

WINTERING IN THE WILDERNESS

Barry Abley VK3YXK,
61 Peter Street, Grovedale, Vic. 3216



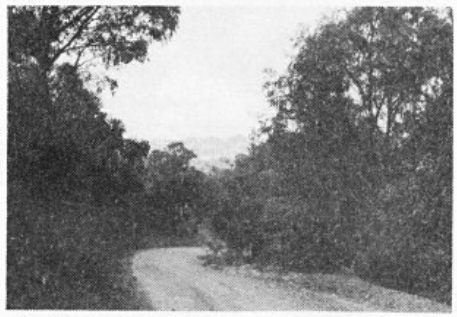
During July and August 1985, the writer had the stimulating experience of visiting 24 National Parks, and qualified for the Keith Roget Memorial Parks Award at the same time.

The welcome advent of long service leave, and a desire to discover the natural beauty of Victoria's National Parks during this 150th year, afforded an excellent opportunity to qualify for the Keith Roget Memorial National Parks Award.

The advantage of undertaking a challenge to visit 20 National Parks during the Winter months of July and August, is an opportunity to appreciate the immense variety of flora and fauna available to the visitor, during a season of serenity. The solitude enables the observer to catch a glimpse of nervous marsupials or timid birds, like the Lyre Bird. An early morning walk can be particularly fruitful when, on occasions, you have the whole park to yourself.

Winter in Victoria offers periods of mild weather, extending from a few days, to a week. The arrival of a High Pressure Cell will result in fine days, crisp mornings and cold nights. During early August, while visiting many beautiful parks in Gippsland, skies were clear and the days perfect without flies.

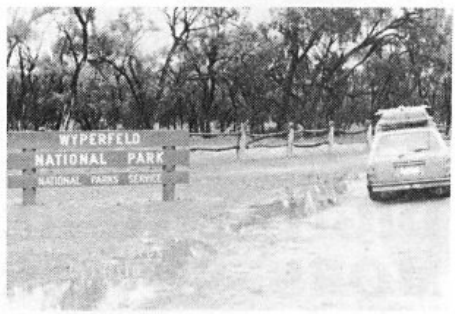
The tremendous variety of scenery and animal life available is only surpassed by the diversity of conditions which face the amateur operator, determined to gain contacts on two metres FM. The proliferation of well sited repeaters makes the task of logging contacts, during a mid-week visit to a National Park, a much easier proposition, than would be the case if simplex contacts only were permitted.



You Yangs from Brisbane Ranges N P.

Thurra River, Croajingolong N P.

Beach Scene from Croajingolong N P.

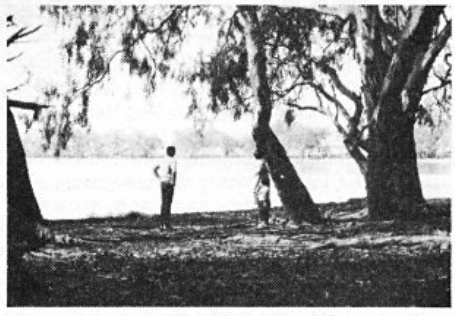


Wyperfeld was wet.

By using a FT480R transceiver and a five element beam, on a four metre mast, a surprising number of repeaters were able to be accessed from parks in all areas of the State. Of the 24 National Parks visited, 22 were in locations from which repeaters were accessible.

I am indebted to amateurs in more remote locations, who went out of their way to arrange scheds, which enabled me to activate parks and gain points for the Award. It would not have been possible to work from Croajingolong, Lind, Alfred and Lower Glenelg Parks without the co-operation of Alan VK3AGK, at Orbost, Lindsay VK3ANJ, at Lakes Entrance and Doug VK5AJR, at Penola, SA. A great deal of satisfaction was gained by being able to access the Warrnambool Repeater, VK3RWL, using a FT207R hand-held, from the summits of Mounts Eccles and William, during the first week of operation of the repeater in its permanent site.

The Keith Roget Award encourages the amateur operator to enjoy the delights and uncertainties of portable operation, and at the same time, appreciate the scenic beauty of Australia's parks. This

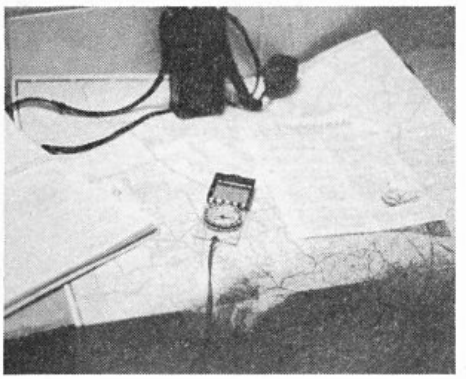


Lake Hattah, Hattah-Kulkyne N P.

REPEATERS ACCESSED FROM NATIONAL PARKS VISITED

NAME	APPROX DIST FROM MELB:km	SIZE/ha	ROAD CONDX	VK REPEATERS ACCESSED/VK
SOUTH-WEST VICTORIA				
Otway NP	200	12750	S/G	3RML,7RAA & 7RNW
Port Campbell	250	1750	S	3RBA
Mount Eccles	200	400	S	3RWZ, 3RWL, 3RBA, 5RMG
Mount Richmond	350	1707	S/G	3RWL, 5RMG
Lower Glenelg	400	27300	S/G	5RMG
Grampians	200	167000	S/G	3RBA, 3RMM, 3RCV, 3RWL, 3RWZ & 5RMG
NORTH WEST				
Wyperfeld	450	100000	S/G	Nil
Little Desert	380	35300	S/G	3RWZ
Hattah-Kulkyne	500	48000	S/G	Nil
NORTH EAST				
Fraser	150	3750	S/G	3RML, 3RBA, 3RGL & 3RCV
AROUND MELBOURNE				
Brisbane Ranges	75	7485	S/G	3RBA, 3RGL, 3RML, 3RSG & 3RMM
Organ Pipes	30	85	S	3RML, 3RBA, 3RGL & 3RMM
Kinglake	55	11290	S	3RML, 3RGL, 3RMM, 3RCV, 3RSG, 3RWG & 3RLV
Ferntree Gully	34	466	S	3RML, 3RGL & 3RWG
Churchill	40	193	S	3RML, 3RGL, 3RBA & 3RMM
SOUTH/WEST GIPPSLAND				
Wilsons Promontory	250	49000	S	3RLV, 3RSG & 3RML
Tarra Valley	200	140	G	3RML, 3RLV & 3RWG
Bulga	215	80	S	3RML, 3RLV
Morwell	170	283	S	3RML & 3RLV
EAST GIPPSLAND				
The Lakes	330	2380	S/G	3RLV
Glenaladale	300	183	S/G	3RLV & 3RWG
Croajingolong	495	86000	S/G	3REG
Lind	450	1166	S/G	3REG
Alfred	500	2300	S	3REG & 3RLV

S denotes Sealed Road . . . G denotes Gravel Road



Some of the gear used on the N P Expedition.

variety is reflected in the contrast of Victoria's National Parks, and range from the rugged coastline of Port Campbell N P, the fern lined forest gullies of Tarra Valley, Bulga and Lind N Ps, to the open Mallee plains and river red gums of Wyperfeld and Hattah-Kulkyne.

I thank the late Keith Roget for the inspiration of this award, and encourage other amateurs to combine the pleasures of our rewarding obsession with some of Australia's beautiful places.

AR

SIMPLE ADD-ON TUNING INDICATOR FOR S E Q T G DEMODULATOR

D C Hunter VK4ADC
South East Queensland Teletype Group
PO Box 184, Fortitude Valley, Qld. 4006

Since the introduction of the SEQTG TG170D demodulator PCB, in about 1980, some 300 boards have been sold throughout Australia and the Pacific. In the original design, the tuning indicator was in the form of a meter, which gave a steady indication when the receiver was correctly tuned to the incoming RTTY signal. The circuit described in this article allows the inclusion of two LEDs to make the tuning even easier.

One LED driver circuit is fed from the output of the mark channel bandpass filter in the demodulator, while another is, in turn, fed from the space channel. The audio signal from each channel is then fed to the respective peak envelope detectors and the resultant DC is used to vary the forward base bias current of the respective transistors. A LED, in series with a current limiting resistor, is then connected between the positive supply rail of the demodulator and the collector of each transistor.

No retuning of the demodulator is normally required after connection of the circuit to the final mark and space test points, however a quick tuning check is desirable. As the LED driver circuit is linear, the advantage of its level sensitivity can be utilised by reducing the mark or space audio tone level to the point where the particular channel LED is just glowing quickly.

The three bandpass trimpots can then be tuned for optimum response as indicated by the LED.

Since layout is reasonably non-critical, the construction is left to the individual, although veroboard or a PCB is recommended. Transistor types and component values can be changed to suit your spare parts supply, but within normal selection tolerances, as this design is relatively non-critical.

AR

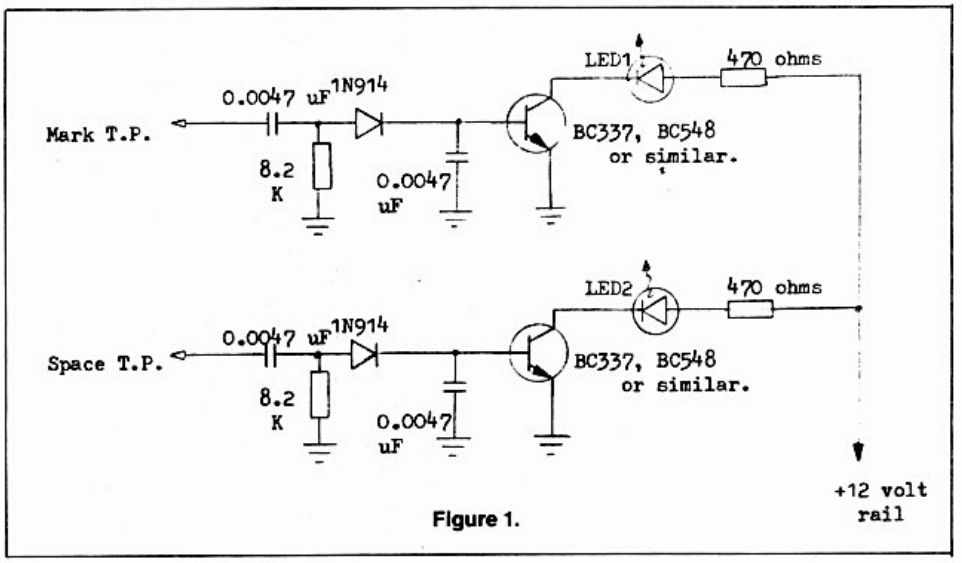


Figure 1.

International News

Larry Price W4RA.

Carl Smith W0BWJ.

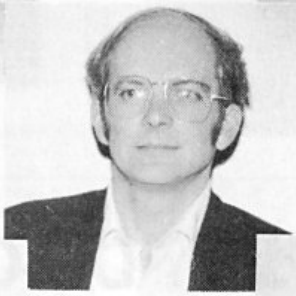
David Rankin 9V1RH/VK3QV.

John Allaway G3FKM.

Al Shaio HK3DEU.

Dick Baldwin W1RU.

Michael Owen
VK3KI.



David Sumner K1ZZ.

David Wardlaw VK3ADW.

Pedro Seidemann YV5BPG.

Lou van der Nadort PA0LOU.

Photographs courtesy Bett McLachlan.

IARU MEMBERS MEET IN MELBOURNE

Member societies of the IARU met in Melbourne, prior to attending the WIA's 75th Anniversary Dinner, for discussions about the forthcoming Sixth Conference of the IARU Region 3 Association in Auckland, NZ.

NEW MEMBERS

The Brunei Amateur Radio Transmitting Society (BARTS) was elected to the membership of the IARU, in July 1985. Also, the Amateur Radio Club of Tonga (ARCOT) has submitted an application for membership, so it is anticipated they will become the 24th Member of the IARU, Region III.

REUSING OLD CALLS

Amateur stations in Japan have made such a rapid and large growth that statistics published in September 1985 state the number of stations as over 600 000.

Owing to this trend, authorities were concerned that they would run out of call signs with the prefixes JA-JS, allocated by the ITU for the JA1 area, which is situated in and around Tokyo.

To cope with the shortage, the authorities have decided to assign call signs, once issued but now abandoned, to new stations. The new ruling came into effect in October 1985. It will now be that prefixes JE-JS will be used and the suffixes will be a combination of three alphabetical letters. Call signs with two letter prefixes will no longer be used.

Stations in Ogasawara and Minami-Torishima islands will retain their old prefixes.

From Region 3 News — October 1985.

LATITUDE AND LONGITUDE FROM A STREET DIRECTORY

Noel Lavelle VK3ABH

4 Wembley Court, Forest Hill, Vic. 3131

Now that the Melway's Street Directory for Greater Melbourne includes the 1km Australian Map Grid (AMG), it seemed that a simple programme could convert AMG co-ordinates to latitude and longitude with a fair degree of accuracy. AMG information appears on page 14 of the directory. The listing shown in this article is for a Sharp PC1200 (Tandy TRS-80, Model PC1), Pocket Computer. Few small computers have the number crunching capability of this particular device, which has been a most useful tool in the shack, and elsewhere, for half a decade.

The programme is so simple that little comment is necessary — the memory allocation shows what is where.

Initialisation is mainly concerned with formatting the output to suit the 16 character per line printer, or the inbuilt 24 character liquid crystal display (LCD).

Data entry and selection of the appropriate vertical and horizontal co-ordinates, and the mean convergence angle between True North and AMG from the data array follow.

The DIM statement is not available in PC1 Basic and specific addressing of the three-way "two-dimensiona" arrays is hard to read. The

```
10:REM -MAPGRID
  -
20:REM INITIALZ
  -
30:"A"CLEAR :T$
   ="S":U$="E":
   X=.00014
40:INPUT "PRINT
   ER RQD (Y,N)
    ";Q$
50:IF Q$="Y"LET
   R$="LAT. =":
   S$="LONG.="
55:REM
60:REM ENTRDATA
  -
70:"M"INPUT "NO
   RTHING? ";H
80:INPUT "EASTI
   NG? ";V
85:REM
90:REM PICKGRID
   ----VERTICAL
  -
100:IF V>357LET
   B=145.5:P=0:
   GOTO "B"
110:IF V>335LET
   B=145.25:P=1
   0:GOTO "B"
120:IF V>313LET
   B=145:P=20:
   GOTO "B"
130:IF V>291LET
   B=144.75:P=3
   0:GOTO "B"
140:IF V>269LET
   B=144.5:P=40
   :GOTO "B"
150:B=144.25:P=5
   0
180:REM
190:REM PICKGRID
   --HORIZONTAL
  -
200:"B"IF H>5833
   LET G=22.1:A
   =37.5:GOSUB
   400+P:GOTO "
   C"
210:IF H>5806LET
   G=22:A=37.75
   :GOSUB 500+P
   :GOTO "C"
220:IF H>5778LET
   G=21.95:A=38
   :GOSUB 600+P
   :GOTO "C"
230:IF H>5750LET
   G=21.87:A=38
   .25:GOSUB 70
   0+P:GOTO "C"
240:G=21.8:A=38.
   5:M=1.1:
   GOSUB 800+P
280:REM
290:REM CALCULAT
  -
300:"C"E=-.25/27
   .74:F=.25/G
310:I=C-H:J=D-V
320:K=DMS (A+X-(
   E*(I-J*TAN M
   )):L=DMS (B+
   X-(F*(J+I*
   TAN M))
330:REM
340:REM --LIST -
  -
350:"L"PRINT
   USING ;H,V
360:PRINT USING
   "####.####";
   R$;K;T$;S$;L
   ;U$;" "
370:GOTO "M"
380:REM
390:REM GRIDDATA
  -
400:C=5848.59:D=
   367.4:M=1:
   RETURN
410:C=5848.2:D=3
   45.31:M=1:
   RETURN
420:C=5847.75:D=
   323.2:M=1.3:
   RETURN
430:C=5847.23:D=
   301.1:M=1.5:
   RETURN
440:C=5846.72:D=
   279:M=1.6:
   RETURN
450:C=5846.07:D=
   256.9:M=1.7:
   RETURN
500:C=5820.85:D=
   367.85:M=1:
   RETURN
510:C=5820.48:D=
   345.83:M=1:
   RETURN
520:C=5820.02:D=
   323.8:M=1.3:
   RETURN
530:C=5819.49:D=
   301.78:M=1.5
   :RETURN
540:C=5818.96:D=
   279.75:M=1.6
   :RETURN
550:C=5818.31:D=
   257.72:M=1.7
   :RETURN
600:C=5793.12:D=
   368.3:M=1:
   RETURN
610:C=5792.7:D=3
   46.35:M=1.1:
   RETURN
620:C=5792.28:D=
   324.4:M=1.3:
   RETURN
630:C=5791.74:D=
   302.45:M=1.5
   :RETURN
640:C=5791.2:D=2
   80.5:M=1.6:
   RETURN
650:C=5790.57:D=
   258.53:M=1.7
   :RETURN
700:C=5765.38:D=
   368.75:M=1:
   RETURN
710:C=5764.96:D=
   346.88:M=1.1
   :RETURN
720:C=5764.54:D=
   325:M=1.3:
   RETURN
730:C=5764.03:D=
   303.13:M=1.4
   :RETURN
740:C=5763.47:D=
   281.25:M=1.5
   :RETURN
750:C=5762.91:D=
   259.37:M=1.7
   :RETURN
800:C=5737.64:D=
   369.2:M=1:
   RETURN
810:C=5737.22:D=
   347.4:M=1.1:
   RETURN
820:C=5736.8:D=3
   25.6:M=1.3:
   RETURN
830:C=5736.27:D=
   303.8:M=1.4:
   RETURN
840:C=5735.73:D=
   282:M=1.5:
   RETURN
850:C=5735.24:D=
   260.2:M=1.7:
   RETURN
```

more cumbersome sub-routine method was used to provide better readability and, if desired, direct conversion to standard arrays.

If single step conversion of decimal degrees to degrees, minutes and seconds is not available on your processor, delete DMS, X and the outer brackets from both expressions at line 320 and add the appropriate instructions to perform the conversion, or leave the result as decimal degrees if it suits your purpose.

The grid data table was compiled from the current issue of 1:100,000 series Survey Maps to Australian Geodedic Datum 1966. Other maps could give numerical values for latitudes and longitudes, which differ by up to four or five seconds, or so.

The test data for nominal five minute intersections was included to enable programme checking.

			REFERENCE	AMG DATA		
LINE NO. (P) >			50 40	30 20	10 00	
LONGITUDE >			144D15M 144D30M	144D45M 145D00M	145D15M 145D30M	
DATA STARTS AT LINE	LATITUDE				^ 15 MINUTES ^ V = 27.74 KM. V	
			15 MINUTES	= 22.1 KM		
400	37D30M	C=	5846.07 5846.72	5847.23 5847.75	5848.20 5848.59	
		D=	256.90 279.00	301.10 323.20	345.31 367.40	
		M=	1.7 1.6	1.5 1.3	1.0 1.0	
			15 MINUTES	= 22.00 KM		
500	37D45M	C=	5818.31 5818.96	5819.49 5820.02	5820.48 5820.85	
		D=	257.72 279.75	301.78 323.80	345.83 367.85	
		M=	1.7 1.6	1.5 1.3	1.0 1.0	
			15 MINUTES	= 21.95 KM		
600	38D00M	C=	5790.57 5791.20	5791.74 5792.28	5792.72 5793.12	
		D=	258.53 280.50	302.45 324.40	346.35 368.30	
		M=	1.7 1.6	1.5 1.3	1.1 1.0	
			15 MINUTES	= 21.87 KM		
700	38D15M	C=	5762.96 5763.47	5764.03 5764.54	5764.96 5765.38	
		D=	259.37 281.25	303.13 325.00	346.88 368.75	
		M=	1.7 1.5	1.4 1.3	1.1 1.0	
			15 MINUTES	= 21.8 KM		
800	38D30M	C=	5735.24 5735.73	5736.27 5736.80	5737.22 5737.64	
		D=	260.20 282.00	303.80 325.60	347.40 369.20	
		M=	1.7 1.5	1.4 1.3	1.1 1.0	

```
   * MAPGRID *
 MEMORY ALLOCATED        TEST DATA

 A =REF. LATITUDE                    5856.83                    5802.23
 B =REF.LONGITUDE                     315.6                      360.83
 C =NORTHING REF.      LAT. =  37.2500S          LAT. =  37.5500S
 D =EASTING REF.       LONG.= 144.5459E          LONG.= 145.2500E
 E =N/S DEG./KM.
 F =E/W DEG./KM.                     5836.38                    5780.94
 G =E/W KM/15MINS                     242.46                     244.18
 H =NORTHING I/P.      LAT. =  37.3500S          LAT. =  38.0459S
 I =DELTA NORTHNG      LONG.= 144.0500E          LONG.= 144.0500E
 J =DELTA EASTING
 K =O/P LAT. D.MS                    5837.24                    5781.96
 L =O/P LONG.D.MS                     271.89                     280.75
 M =CONVERGENCE <      LAT. =  37.3501S          LAT. =  38.0500S
 P =DATA POINTER       LONG.= 144.2500E          LONG.= 144.3000E
 Q$=PRINTER FLAG
 R$=PRINTER LAT-                     5800.24                    5745.69
    ITUDE LABEL.                      272.91                     310.85
 S$=PRINTER LONG-      LAT. =  37.5500S          LAT. =  38.2500S
    ITUDE LABEL.       LONG.= 144.2459E          LONG.= 144.5001E
 T$=LAT.DIRECTION
 U$=LON.DIRECTION                    5838.66                    5783.73
 V =EASTING INPUT                     330.77                     361.15
 X =DEGREE VALUE       LAT. =  37.3500S          LAT. =  38.0501S
    OF 0.5 SECOND      LONG.= 145.0500E          LONG.= 145.2500E

                                     5839.21                    5746.19
 DMS FORMAT:                          360.2                      332.68
 INTEGER =DEGREES      LAT. =  37.3500S          LAT. =  38.2501S
 1+2 DEC.=MINUTES      LONG.= 145.2500E          LONG.= 145.0501E
 3+4 DEC.=SECONDS
```

For the area covered, one second of latitude is approximately equal to 30.8m, and one second of longitude varies from about 24.2 to about 24.5m.

Users of pocket computers of the types mentioned should note that it is impossible to load the programme as it is listed. Omitting all remarks will leave the basic programme to exactly fill the available programmable memory. (MEM shows 0 steps 0 memories). The remarks were appended by listing the programme in two parts. **AR**

AMATEUR RADIO CROSSES THE NULLARBOR

Graham Horlin-Smith VK5AQZ
2 Athol Avenue, Tranmere, SA. 5073

The following is a report of a historical Railway Mobile DX-Pedition on the Trans-Australian, across the Nullarbor Plain. The round trip of 5320km from Adelaide to Perth, and return, occupied rail-time of five days travelling.

A chance QSO with Graham Prince VK5BGP, an employee of Australian National, concerning the possibility of working amateur radio on the Trans-Australian, led to further negotiations taking place with a public Relations Officer of Australian National. Immediate acceptance for a planned railway trip was given. In all, the initiation and completion of the promotional journey took less than three weeks to organise.

The amateur group departed Keswick Main Terminal on 11th September, arrived Perth on 13th, and returned to Adelaide in the evening of 16th. Accommodation was a Wegner First Class Coach, provided by Australian National, who also handled media coverage in Adelaide whilst Westrail covered the Perth end of the historic journey.

AND SO TO MAKE IT WORK

The SA Division's Jubilee 150 Task Force were responsible for suitable antennas, equipment, and display material to highlight the radio activity.

On Preparation Day, Saturday, 7th September, a variety of antenna systems were assembled. The antennas consisted of a 25 metre long wire, end fed to a TS93X, for 80 and 20 metre work, a 40 metre Hustler, linked to a TS820S, was attached to the passenger entrance hand rail, and extended above the roof of the mobile coach. A 40 metre whip was fixed directly opposite the Hustler on another hand rail. A TR2500 hand-held with base power supply and a Kyokuto FM, with homebrew scanner and 60 watt amplifier maintained 2 metre communications from a quarter wave base antenna clamped to the coach roof.

The long wire configuration is worthy of comment. As all antennas were limited to a height of half a metre above the roof, to allow clearance under bridges and tunnels, the open wire was suspended at this height with 10 spaced 13mm pieces of varnished doweling, and secured to the roof with 63mm diameter suction cups. Two 25mm pieces of water pipe, with doweling sleeved into each pipe supported the long wire at each end of the coach.

Rod Durbridge of the South Coast ARC, on the roof of the Wegman Coach, adjusting the long wire antenna.

With preparations complete, the last job before departure was to 'dress-up' the mobile home internally, and externally, with promotional material to identify, "Amateur Radio, Live Across the Nullarbor", and to highlight the historical significance of the expedition. Block letters 229mm high on signs almost the length of one side of the 25m coach said it all; *"SA Amateurs — World Communications with Australian National — Across the Nullarbor" and 305mm letters detailing the call signs VI5JSA and VK5JSA.*

Due to turn arounds at Port Pirie and Kalgoorlie of the twin diesel hauler, particular attention was given to lighting up the passenger platform side of the train at ports of call. Inside the comfortable 15 berth carriage, corridor, and operating locations, colourful posters completed the story of the SA Division's involvement in the activity.

The entourage, once on the rails, resembled something not unlike a mobile amateur flying flagship coach, with an antenna clothesline locked into the huge Trans Australian Nullarbor convoy. Travelling at speeds of up to 110km per hour, it was indeed an exciting adventure for the three amateurs, plus the two Australian National employed amateurs on board.

Ready to go. (From left) Alan VK5ZN, Bob VK5BJA, Peter Koen, Graham VK5AQZ, Rowland VK5OU.

REASONS AND OBJECTIVES

The main aim was to promote Australian National by making Australian and world wide radio contacts. This was done to the tune of in excess of 500 logged contacts.

The trip also provided the group with the opportunity to make some mention of Jubilee 150 activities for South Australia in 1986, the America's Cup in Western Australia in 1987, and the Grand Prix for Adelaide in November 1985.

EXPERIMENTATION

Whilst there will be abundant, well documented evidence to suggest that many of these aims and objectives were met by the group, the trip also provided a golden opportunity to experiment with antenna systems, reaffirm amateur links between the SA and WA Divisions of the Institute, and to promote goodwill by way of radio exchanges with Australia and the world.

Because of the peculiar location of working railway communications, the choice was made

BELOW:
The Goldfields Amateur Radio Group welcomed the train at Kalgoorlie. (From left)Phil SWL 60370, Graham VK5AQZ, Alan VK5ZN, Susan, XYL of VK6ZGQ, Dianne VK6KYL, Bill VK6ZX, Bert VK6ZAJ, and Lewis VK6ZGQ. Bill is receiving a SA Jubilee 150 Flag.

BELOW:
VK6 Farewell Party. (From Left)Steve VK6IR, his XYL Sherie, Alan VK5ZN, Trevor VK6CI, his XYL Margaret, Graham VK5AQZ, Peter Koen.
(Front)John, Anthea, Marilyn Prestage, and an unknown VK6 amateur.

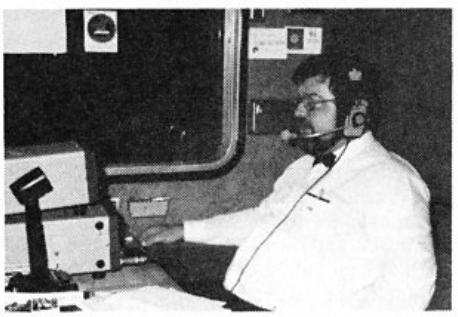
At Port Augusta, local residents Ron VK5AP and Peter VK5BWH visited the train. (From left) Ron, Peter, Graham VK5AQZ, Alan VK5ZN and Peter Koen.

to work strictly barefoot operations. The dangers of using a high-powered linear may have caused problems like loading the antennas, which, at the best of times, may not have been totally efficient systems.

Links were reaffirmed with the amateur populace along the way, in particular with the Goldfields ARC in Kalgoorlie. Platform cheering, waving, banner flying, generous words of welcome, and presentation exchanges made the meeting and link all the more worthwhile.

The many logged contacts were confirmed, railway mobile two-way QSOs, on the Jubilee 150 special souvenir QSL cards. Later, confirmations of the VI75A call sign, activated for about 24 hours of the return trip, will be sent. Propagation and band conditions were not brilliant, but it just meant the group had to work a little harder for the contacts.

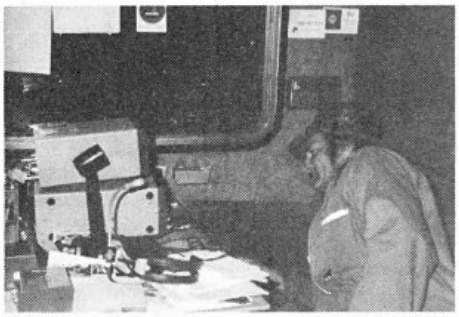
Graham VK5AQZ, operates two metres through the Bluff Repeater, Port Pirie.



Graham VK5BGP, has his turn at the operating desk.

SUCCESSFUL JOURNEY

The attention and interest shown by passengers and visitors to the operation, the keeping of a visitors book, and the many requests for Peter Koen's special silk-screened wall poster depicting the trip, made for pleasurable engages with the people along the way. Peter also made good use of video and camera equipment to provide a record of the trip for the future. The group also added to the limited communications aboard the train, as they are



The Train Examiner, Mr Henry Cox checks the TS93X.

limited, particularly between Port Augusta and Kalgoorlie, save for emergency telephones placed strategically along the tracks.

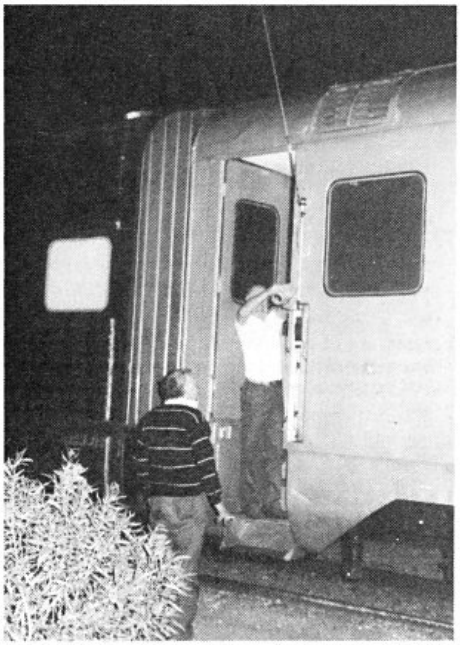
Media coverage was exceptional, thanks to press releases by Australian National. Local radio stations, 5DN and SAFM ran news clips, as did television channels 9 and 10 in South Australia, also Channel 9 in New South Wales. The group were also interviewed for the VK6 WIA Sunday Broadcast by Douglas VK6ZMG and Sue VK6JU.

A special interview, with Bob Burns of 5DN, was made in a special amateur to amateur hookup. Bob was in the shack of Bob VK5BJA and interviewed the group as they were mobilising over the SA/WA border. Parts of the interview were played on the following two mornings breakfast show.

Overall, the trip was a resounding success.

SOME CONTACTS OF NOTE

Douglas VK6ZMG, VK6 WIA Broadcast Officer; Bob VK5BJA, with Bob Burns, DJ with 5DN, as second operator; Bill VK6AG, first QSL — hand-delivered to Perth Terminal; Ken VK2GA — first postal QSL; Don VK5ADD, SA Councillor and JOTA Co-Ordinator; Trevor VK6CI — worst RST (2x1); Peter VK5BWH, and Ron VK5AP — eyeball QSO at Port Augusta; Ron VK5RV, at Rawlinna Crossing, 1036km from Perth, waving his two metre hand-held; Jerry VK3CK - second worst RST (2x4); Chuck VK6CF — big RST; Bill VK6ZX — rail mobiler entrepreneur; Ray VK6ET and the Goldfields ARC, Kalgoorlie; Bob VK5BJA — most technical/production calls.



Alan VK5ZN makes adjustments to the 40m whip, supervised by Graham VK5AQZ.

Photographs courtesy Peter and Joanne Koen.

Special thanks are extended to the following: Bob VK5BJA, Alan VK5ZN, Rob Durbridge, Peter Koen and Graham VK5AQZ for all their pre-trip work. Bill VK6ZX and Dianne VK6KYL for their entrepreneur skills. Rolley Housden, Westrail Technician, who saved the antenna farm. Australian National employees Keith VK5NAX and Graham VK5BGP working on-duty amateurs, and PR work amongst the passengers. Angelo of Westrail, who stopped the train 10 minutes out of Perth so that Alan VK5NZ could periscope the resonator above the train roof to increase contact possibilities (and it worked).
The group acknowledges the support of the following: Australian National and Bob Sampson AN Promotions Officer; Westrail; Staff and employees of both railways; WIA SA Division; Rowland Bruce VK5OU — Federal Councillor; Joe Valente and Captain Flash Ensigns; John Moffatt and International Communications Services; Jubilee 150 Brochures; Department of Tourism — QSL cards; Nigel Jays of Dick Smith Electronics; Rob Durbridge and South East ARC — equipment; Bob Dodd VK5ADR — 2 metre equipment; Dick Ashton VK5DQ — antennas; John Ingham VK5KG — video films; Mark Thwaites Menswear.
The amateur group were: Alan Roocroft VK5ZN; Peter Koen Secretary VK5BPA; and Graham Horlin-Smith VK5AQZ with much assistance from Australian National amateurs Keith Pettman VK5NAX and Graham Prince VK5BGP.

AR

QSP

ELEVENTH-HOUR BID TO KEEP GREENWICH TICKING

Keepers of Greenwich Mean Time plan to let their clocks run down and stop — although eleventh hour attempts are being made to keep them going.

Royal Greenwich Observatory's six atomic clocks would be left to stop over the next two or three years because there isn't enough money for their maintenance.

The Observatory has been keeping time since its founding in 1675, although the world has, for some years, relied on time readings by the International Organisation of Legal Metrology (Weights and Measures), in Paris, which provides Co-ordinated Universal Time.

Timekeepers originally began keeping the GMT standard using a Grandfather Clock, but with atomic technology, time keeping accuracy was to one-millionth of a second.

At the heart of the clocks are expensive vacuum tubes containing the atomic element cesium, which have to be replaced every few years.

The problem is that it costs between $100 000 to $200 000 (Australian) a year to keep the six aging clocks operating.

NEW TIME DELAY

SBS-TV has unveiled an advanced new programme time delay system which will allow the network to transmit material to four different local time zones across Australia — the first system of its kind in the world.

From 27th October, the SBS-TV system has allowed the network to direct programmes from its Sydney studios to South Australia and Queensland, in their respective local times.

The operation of the new delay system coincided with the onset of Daylight Saving. From 27th October, South Australia is still 30 minutes behind Eastern Standard Time, while Queensland's non-adjustment to DST has placed them one hour behind.

The system will also come into operation in Perth, when SBS-TV begins operation there early this year. Perth is three hours behind DST.

The system, manufactured by the Sony Corporation of Japan, is a result of extensive research to develop an efficient method of transmitting networked television programmes across Australia.

The time delay equipment is divided into three areas. The heart of the system is in the network's Milsons Point studios, Sydney. The two other systems are located in Melbourne and Perth, delaying programmes to South Australia and Western Australia, respectively, and consists of 23 video tape machines, and six unique delay system controllers. This new system will allow SBS-TV to feed its material to all markets at the same local time, ie 'World News' at 7.00pm in all areas.

By automatically holding programmes for the necessary period, viewers in the different interstate time zones will be unaware that the material they are viewing is being delayed in any form.

AUSTRALIAN RADIO JOURNALS BEFORE 1939 — A SURVEY

Chris Long,
6 Torring Road, East Hawthorn, Vic. 3123

*Continued from December. . .

A really extraordinary Melbourne journal published at the end of the 1920s was RADIOVISION, published by Television and Radio Laboratories and edited by Donald Macdonald. It ran monthly from September 1928 to October 1929. Macdonald kept his readers up-to-date on the latest developments in Baird-type mechanical television and facsimile, corresponding constantly with such American pioneers as C

11th July 1928.

Francis Jenkins and Dr E F W Alexanderson. His chief engineer was Gil Miles VK3II [later VK2KI], who built the first working television system in Australia for the company. After some months of test television transmissions through 3UZ, the experiments were terminated, and the magazine seems to have folded at about the same time. A bound set of this journal is held by the State Library, and a few duplicate issues are held by the Museum of Victoria.

At least one Australian radio firm ran a staff magazine during the 1920s. AWA in Sydney published THE RADIOGRAM from about 1928. It was a scaled-down equivalent of the American BELL LABORATORIES RECORD, containing social and general technical information on their corporate activities. Today, with much of AWA's early official records lost or discarded, it is an important guide to the experimental work of a major local manufacturer.

A journal, which I know only from lists of magazines for sale from Homecrafts, is the AUSTRALASIAN WIRELESS REVIEW, published about 1925. Does anybody know what this journal contained? I assume that it was Sydney-based, as no copies are held in the State Library of Victoria.

From about the start of 1930, Ossie Mingay in Sydney, published the RADIO AND ELECTRICAL MERCHANT, later the RADIO RETAILER OF AUSTRALIA, as a professional weekly trade paper. While not relating directly to amateur radio activities, it contains much detail of the personal and professional lives of many prominent amateur operators. It also contains a host of facts and figures pertaining to communications, broadcasting and electronic hardware. Mingay's publishing company, Australian Radio Publications Limited of Sydney became very active in promoting local trade journals and annuals. From the historian's point of view, the most important of these is the RADIO TRADE ANNUAL OF AUSTRALIA, published yearly from 1933 until at least 1942. This is an indispensable compendium of radio facts and figures, including such key items as Annual Reports of the ABC, popular receiver circuit designs, directories of radio importers and manufacturers throughout Australia, and a 'who's who' of radio trade and engineering figures. It was sometimes known as the RADIOTRON TRADE ANNUAL. From 1935, they also published the BROADCASTING BUSINESS YEAR BOOK, providing an inside view of facts and figures on Australian B class (commercial) radio broadcasting.

Radio journals proliferated around Australia during the 1930s, and many of them were listed regularly in the RADIO TRADE ANNUAL OF AUSTRALIA:

"AUSTRALASIAN RADIO WORLD (Sydney), published monthly from May 1936 until about 1951. A technical journal in similar vein to the present ELECTRONICS AUSTRALIA, including frequent articles on aspects of amateur radio.

"SHORT WAVE RADIO NEWS (Sydney), a specialist enthusiast's magazine, of which only a few monthly copies from 1936 are held in the State Library of Victoria.

"RADIO REVIEW (Sydney, early 1931), later TELEVISION AND RADIO REVIEW (from October 1931), later again the RADIO REVIEW OF AUSTRALIA. A monthly technical journal incorporating the early proceedings of the Australian IRE.

"AUSTRALIAN RADIO NEWS (Sydney, from c1933), weekly programme and technical journal published by the BULLETIN.

"ERDA, monthly official organ of the Electrical and Radio Association of New South Wales, from c1933.

"QUEENSLAND RADIO NEWS, a Brisbane monthly technical and programme magazine, established in February 1925 and running well into the 30s.

"RADIO MONTHLY, a Sydney publication for amateurs and radio experimenters, running from 1931 to at least 1935.

"THE BROADCASTER, a Perth weekly programme and technical paper circulated in Western Australia. Active by 1934, possibly earlier.

WEST AUSTRALIAN WIRELESS NEWS AND MUSICAL WORLD, a Perth fortnightly programme and journal, active c1934.

BROADCASTING BUSINESS, a national weekly trade paper based in Sydney, covering the activities of commercial B class stations, from c1934.

"RADIO PROGRAM, later RADIO-PROGRAM PICTORIAL, a non-technical weekly radio entertainment magazine, published in Melbourne from 1934, containing programmes, programme notes and articles.

"TELERADIO, a weekly Brisbane magazine with technical and programme material, on sale right through the 30s, possibly earlier.

"LISTENER'S WEEKLY AND SCREEN NEWS, an Adelaide weekly programme guide, non-technical with articles on radio entertainment, illustrated. Published from c1935.

"RADIO PICTORIAL OF AUSTRALIA, Sydney weekly popular magazine for listeners, published from c1935.

"TEMPO AND TELEVISION, Sydney music, radio, gramophone and entertainment magazine, first published 1937.

"RADIO CALL, Adelaide weekly equivalent of the LISTENER-IN, semi-technical but mainly radio entertainment and programmes, published from c1933 onwards.

To place this in perspective, these journals survived in the face of competition from over 100 British and American radio journals like WIRELESS WORLD and RADIO NEWS. This is a true indication of extreme public interest.

Some of the more professional radio magazines, not intended for public sale, should also be mentioned for the sake of completeness. Various branches and associations within the PMG's Department published journals during the 1930s. Among the expected papers on telephone technology, the occasional radio article pops up. Some of the best papers were published by the members of the PMG Research Laboratories, which were at 59 Little Collins Street, Melbourne, in those days. All technical equipment for the Australian Broadcasting Commission had to be tested by them prior to installation, and their tests were published in many cases. Some of them appeared in the TELECOMMUNICATION JOURNAL OF AUSTRALIA, a rather formal journal established in 1935 with covers of blue cartridge paper, not unlike a thin version of the early Bell Systems Technical Journal, which

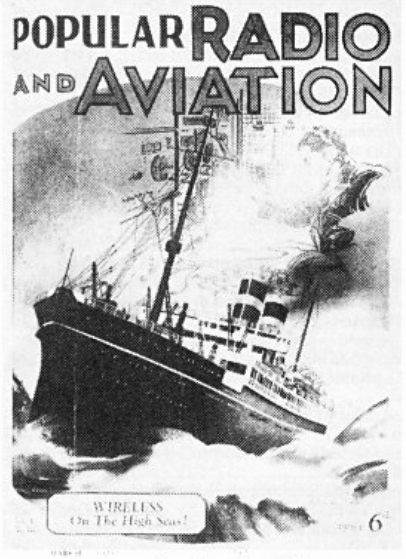
perhaps they were emulating. More papers of this type were published in the obscure AUSTRALIAN POSTAL ELECTRICIAN, which is held by very few libraries. I have only seen copies held by old PMG employees.

Papers of a more purely scientific type were published in the AWA TECHNICAL REVIEW (commenced 1936), or as papers from the Radio Research Branch of the CSIR, later the CSIRO.

Irregular pamphlets are probably a borderline case for inclusion in this article, but it's worth noting that in the late 20s the Australian Broadcasting Company published many of Howard Kingsley Love's regular radio talks in this form. They cover many aspects of radio and amateur radio in general terms. Some of these have been preserved in the engineering pamphlet collection of the State Library.

Another particularly interesting and voluminous early document on radio is the transcript of the first ROYAL COMMISSION INTO WIRELESS BROADCASTING 1926-27. Evidence was accepted from hundreds of radio operators, listeners, radio clubs, engineers, programme makers and others in all states. The verbatim transcripts run to 13 volumes of typescript! These are held by the Australian Archives' Mitchell office in Canberra, along with wireless journals, correspondence books, note books of the commissioners, draft reports and so forth. It is an amazing survival, held at reference number CP657. A lot of other material related to Commonwealth radio services is held there.

Lastly we come to the Institution of Radio Engineers, whose early local proceedings were published in the RADIO REVIEW OF AUSTRALIA. In 1938 the IRE organised a World



1st March 1929.

Radio Convention in Sydney, on an unprecedented scale, to coincide with Australia's 150th birthday celebrations. They published the PROCEEDINGS OF THE WORLD RADIO CONVENTION as an excellent book, containing a host of fascinating technical papers presented by the world's foremost engineering talent. John Logie Baird personally reviewed his early work in TELEVISION — A GENERAL SURVEY, while Dr J D McGee represented his main competitors and read a paper on the Marconi-EMI television system. The story of BROADCASTING IN AUSTRALIA was presented by the Director-General of the PMG, Mr H P Brown, with a useful chronological list of Australian broadcasters appended to his paper. L A Hooke, the General Manager of AWA talked about 'Australian Radio Communication Services'. This covered AWA's involvement with short wave beam wireless, coastal radio and aeronautical radio.

Soon after the 1938 World Radio Convention, the Australian Branch of the IRE began to publish its own monthly journal, bringing the first phase of radio publishing in Australia to a suitably respectable close. The PROCEEDINGS OF THE AUSTRALIAN IRE probably represent the acme of radio publication at the start of the Second World War.

This article was written as a rough attempt to assemble a literature survey of early Australian radio, particularly amateur radio. My research is necessarily limited on journals published for the local market in distant states such as Western Australia and Queensland. Far more research is necessary before a formal bibliography can be published. This is a necessary first step in the progress to a detailed history of the WIA. Only a small percentage of these journals are listed in the Australian Bibliographic Network's SCIENTIFIC SERIALS IN AUSTRALIAN LIBRARIES (SSAL).

Do you have any old Australian radio magazines stored away? Can you add any details to our list?

Perhaps you might like to drop me a line at the above address. A follow-up article will be written, as a result of your response, which I hope will add to the cause of accuracy and scholarship in Australian radio history.

KEY TO LOCATING SOME OF THE RADIO JOURNALS MENTIONED IN THIS TEXT, AT THE STATE LIBRARY (V)

RADIO EXPERIMENTER AND RADIO EXPERIMENTER — BROADCASTER are all bound together in one volume, Dec (23 - July) 25.
Call number: sf 621.384
R 11 E

EXPERIMENTAL RADIO — BROADCAST NEWS AND RADIO BROADCAST (Aust). Some are bound, others are tied together in a bundle with cloth tape.
Call number: sf 621.384
R 11 B

Make sure to ask for Australian (Radio Broadcast), as an American publication of the same name is shelved beside it.

RADIO full name: (Radio In Australia and New Zealand). Most issues, except for the last, are bound, from 4th April '23 to 13th April '27. Unbound vols to 15th Dec '28.
Call number: s 621.384
R 11 I

THE HOME CRAFTSMAN, bound in a single volume, 15th Sept '23 to 16th June '24.
Call number: sf 680.5
H 75 C

HOMECRAFT MAGAZINE, two bound bolumes. Vol 1' June '25 to May '26. Vol 2' June '26 to Oct '26.
Call number: s 680.5
H 75 M

POPULAR HOBBIES, series of bound volumes, Nov 1926 — early 1932.
Call number: sf 680.5
P 81

POPULAR RADIO WEEKLY — small early weekly tabloid issues from 25th Feb '25 to 13th June '28, held with standard size radio books.
l number: s 621.384
1 R

AUSTRALIAN POPULAR RADIO MONTHLY AND POPULAR RADIO AND AVIATION. All bound in single volume under the latter title in folio store.
Call number: sf 621.384
P 81 R

AUSTRALASIAN RADIO WORLD is held in a series of bound volumes in folio store with blue cloth spines.
Call number: sf 621.384
Au 78 R

LISTENER-IN, WIRELESS WEEKLY, RADIO — HOBBIES AND RADIO RETAILER are all held in 621 folio store, and should not be difficult to find.

All of these books are in closed stacks, and are not available for loan for obvious reasons. They may be studied in the reading room on presentation of a call slip with details of the required journal. An attendant will get the material out of the stacks for you. There is no charge for this service. Items of interest may be photocopied, at 10 cents per page, provided that the bindings are in good condition, which in most cases they are.

AR

FINED FOR RADIO INFRINGEMENTS

Many amateurs will be aware of the Departments of Communication's efforts to curb interference on the airwaves. Following is an account, released by Graeme Barrow, Director of Public Relations, of a recent Court Action in Adelaide, which indicates the penalties that can be imposed as a result of illegal use of radio equipment, or license breaches.

A South Australian man, who made the Adelaide CB radio repeater useless for operation by hundreds of other licensees, was fined the maximum of $40 in the Magistrate's Court, and had a $300 transceiver forfeited to the Department of Communications.

Before the Court was Michael Ptasznyk, of Mile End. He was prosecuted under Regulation 12(1) of the Wireless Telegraphy Regulations for breach of the conditions of his CB radio station licence.

Evidence was given that on 29th March 1985, Departmental Officers traced Ptasznyk to a site at Mount Gawler where he was found to be making what the Department considered to be unnecessary and unauthorised transmissions on the Adelaide CB radio repeater.

Ptasznyk was continuously pressing his transmit button, and holding the microphone to the speaker of a cassette tape recorder, resulting in the continuous broadcast of music, etc.

It was stated that the Department had received numerous complaints of such disruptions over the period leading up to his apprehension.

In addition to the penalties listed above, Ptasznyk was ordered to pay $17 court costs, and $150 towards the cost of the Department's investigation.

AR

QSP

NEW TELEPHONE NUMBERS

Every telephone in France had its telephone number changed at the same time, recently. The move saw the conclusion of the use of Area Codes — all 24 million telephones now have eight-digit numbers.

About 22 000 technicians were used for the flick-of-a-switch conversion, which doubled the possible digit-combinations available for phone numbers.

The number system had become saturated, leading to inefficiency and delays in phone connections.

FIVE YEAR INDEX —— ——OF TECHNICAL ARTICLES

Last published on page 30, February 1981 AR

Please Note — Many authors call signs may have changed since these articles were published.

ASIA TELECOM '85 AND 9V1ITU

David Rankin VK3QV/9V1RN
Box 14, Pasir Panjang, Singapore. 9111.

Ever since man began travelling away from his native habitat, Singapore, the 'Lion City', became known as the crossroads of South East Asia. It has had that reputation for centuries, and today, with its ultra modern infrastructure of port and airline terminals, and telecommunication facilities, Singapore still maintains that reputation.

Therefore, perhaps it was only natural that the ITU chose Singapore as the venue for its first telecommunications forum and exhibition, to be held outside its home base of Geneva.

The period 14 to 18th May 1985, saw the co-operation between the ITU and the Telecommunications Authority of Singapore — TELECOMS — that produced 'Asia Telecom '85'.

Amateur radio was represented with a small exhibition station manned by members of IARU, IARU Region III, and the Singapore Amateur Radio Transmitting Society. As the station was set up to demonstrate modern amateur techniques to the senior officers of the ITU, and visiting delegates, it was decided to use only the AMTOR mode on the 14MHz band. Singapore Telecoms also agreed to the station using the special call sign, 9V1ITU.

The station was activated during exhibition hours only, 10am to 6pm. and because of this and poor propagation conditions on 20 metres, contacts were mainly with other AMTOR stations in Australia, Indonesia, and Japan.

Equipment used was an IC751 transceiver, loaned by the local agents, an Apricot terminal supplied by Dan Nelson 9V1SS, and a beam loaned by Kim 9V1RP which was positioned about 60m above ground, on the roof of the hotel.

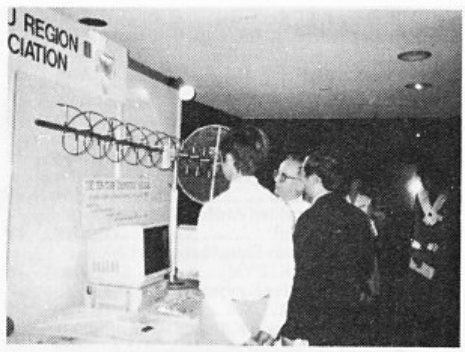
Static displays on the IARU stand included a full scale model of the JARL satellite JAS-1, kindly supplied by Shozo Hara JA1AN, of JARL. There was also a working sample of the 430MHz 'Chopstick' helical antenna designed by Colin Richards 9M2CR, and built by Jaya 9V1VS, which provided a graphic demonstration of alternate technology to interested visitors.

During the exhibition, IARU, IARU Region III and SARTS hosted a small reception for visiting dignitaries, which carried on the tradition established by the IARU at previous ITU forums and conferences in Geneva. A PAL colour tape of 'Amateur Radio's Newest Frontier' was played as a background to the proceedings.

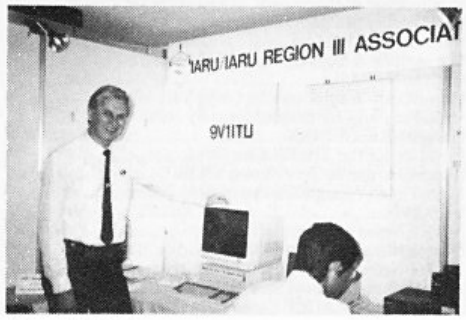
VIPs visiting included Mr Richard Butler and Mr Jipguep, Secretary-General and Deputy-Secretary General respectively of the ITU, Mr Goh Seng Kim General Manager of Telecoms Singapore, and Mr Encik Daud of Jabatam Talikom, Malaysia.

Whilst the use of a venue for an ITU forum outside Geneva was a first for the ITU, it was also a first for the IARU.

AR



David 9V1RH explaining alternative technology to senior officials from Singapore Telecoms.



Klaus 9V1WG and Kim 9V1RP at 9V1ITU.

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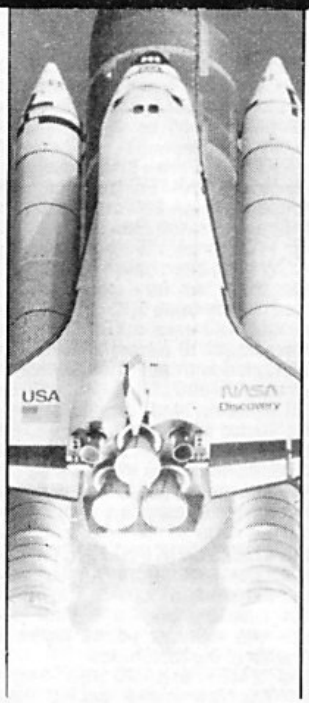

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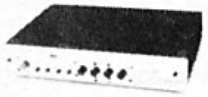

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DCM is a receive only program for the TRS-80C on CW-BAUDOT-SITOR.
RBA provides transceive on RTTY (BAUDOT) — ASCII.

(Note: A modem such as the MDK-17 or MFJ-1224 is required with these programe.

DCM $75 + $5 p&p
RBA $55 + $5 p&p

FAX is a high resolution weather facsimile programe for displaying weather maps etc, received on shortwave. It does not need a modem.

Morse $55 + $5 p&p
FAX $75 + $5 p&p

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Debeglass	2.5	3.9	430	3.0	6.3	560
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AR86

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FREQUENCY	CALLSIGN	LOCATION
50.005	H44HIR	*Honiara*
50.010	JA2IGY	*Mie*[1]
50.060	KH6EQI	*Honolulu*
50.075	VS6SIX	*Hong Kong*
50.109	JD1YAA	*Japan*
51.020	ZL1UHF	*Mount Climie*
52.033	P29BPL	*Loloata Island*
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.325	VK2RHV	*Newcastle*
52.370	VK7RST	*Hobart*
52.400	VK0MA	*Mawson*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.440	VK4RTL	*Townsville*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.470	VK7RNT	*Launceston*
52.490	ZL3SIX	*Blenheim*
52.510	ZL2MHF	*Upper Hutt*
144.019	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.465	VK6RTW	*Albany*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.480	VK8VF	*Darwin*
144.800	VK5VF	*Mount Lofty*
145.000	VK6RPH	*Perth*
147.400	VK2RCW	*Sydney*[2]
432.057	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK1RBC	*Canberra*[4]
432.420	VK2RSY	*Sydney*
432.425	VK3RMB	*Ballarat*
432.440	VK4RBB	*Brisbane*
1296.171	VK6RBS	*Busselton*
1296.410	VK1RBC	*Canberra*[4]
1296.420	VK2RSY	*Sydney*[3]
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*

1 A note from JH2VHL gives the frequency of the JA2IGY beacon as 50.010MHz, so the list has been amended from the original 50.008. JH2VHL confirmed a six metre contact I had with him on 23rd December 1979, and says he keeps a watch on 50.110 and 52,050MHz, and is always looking for six metre contacts.

2 As these notes were prepared in early November, it seems very likely, by the time they are read, that VK2RCW will have made its frequency change to 144.950MHz, (refer these notes December AR, and the article in September AR, page 34, as the proposed 80 metre outlet was given approval for six months from July 1985).

3 I was advised of this beacon by the VK2 boys during the 75th Anniversary Dinner in Melbourne, during November.

4 See Forward Bias column, this issue.

BRISBANE ACTIVITIES

A nice letter to hand from Angus Garland VK4AGQ, (his XYL is VK4QW), says that on 1981 there were about five regulars on the lower end of two metres, now there are about 20, some of whom are mobiles, and often just getting started. One of the longest out-of-town regulars in Bill VK4ZWH, who is at Bundaberg, some 330km distant, and can be worked in Brisbane 24 hours a day, 365 days a year, provided some effort is made. It is unfortunate that splatter from Channel 5A between Brisbane and Bundaberg forces him to operate on 144.100.2, but this must be a hindrance to others when the band opens to other places.

A few stations line-up regularly on Saturdays and Sundays at 2100 for scheds with Gordon VK2ZAB, on 144.300. Angus says it is rare now, not to exchange signal reports during aircraft enhancement. VK4s GC, AUR, BAT, KJL, YJH, AGQ, and VK2FZ/4 have all worked Gordon in recent months. Angus is hoping to also work him on 432.300MHz soon as Gordon has lifted his power to 400 watts, now.

Paul VK4AUR, has just arranged regular scheds with Ted VK4JTW and Joe VK4AEW, in Rockhampton, on 144.200 or 144.250, from 2030 to 2100, Saturdays and Sundays, with liaison on 3.615MHz. Distance is around 600-650km. Carriers/CW have been heard on each of the three weekends tried, so far; reports of 5x1 were exchanged only once on 5/10.

Angus VK4AGQ uses a TS711A — MML 200S — 3.1 wavelength 16 element F9 FT Tonna at 60 feet (18.3m), fed with half inch (13mm) heliax on two metres. FT780R, THP HL 120U, 48/70 J beams at 47 feet (14m), also fed with half inch heliax for 70cm; on six metres an FT690R, plus linear to 40 watts on a very low profile basis! From WSW to WNW, he beams into the side of a hill 150 yards (136m) away, which is bad news, but has a 'fair' look on other directions.

TWO METRE WORKING FREQUENCY

Further to the letter from Angus VK4AGQ — contained therein is a copy of a letter sent to the WIA VK4 Division, and to me for comment. I reproduce the relevant points herewith for the consideration of the multitudes.

Headed "2 METRE BAND SSB" Angus goes on to say: *"The two metre calling frequency is 144.100MHz. There is concern interstate too about conducting QSOs on this frequency, and the VHF column monthly in AR makes reference to the problems constantly.*

"Due to the low level of activity in Brisbane in the past, it became justifiable practice for stations to call and QSO on 144.100 in the hope that, with good operating procedures, DX stations might hear and call during deliberate breaks left for the purpose, calling QRZ. However, with the wider distribution of SSB gear now, the subscriber feels that a local 'natter' frequency should be established, say 144.125MHz.

"If this frequency was so used, and if sufficient publicity were given to the proposal, DX stations wishing to contact Brisbane stations, could try both 144.100 and 144.125MHz. This would avoid clutter of the call frequency, as is happening occasionally lately, with stations mobile (and otherwise), not equipped to hear weak DX. In view of the normal limits of two metre DX, the proposal could possibly be adopted in every place, in every State, where there is an interested SSB group. Most commonly these groups get together early morning and early evening. If all proceeded as proposed, it should produce two frequencies to monitor: 144.100 should be largely clear, except for CQs. The 'natter' frequency pf 144.125 may contain more extended transmissions worth listening for if conditions seem to be right in some particular direction. Observation of good operating procedures should permit a break-in on 144.125MHz.

"With the VHF DX season fast approaching (letter written in October), I seek support of the WIA Queensland Division for this proposal in VK4. If such support is forthcoming, I request that recommendation be made as soon as possible on the WIA News Broadcasts for Queensland stations contacting other stations on the SSB calling frequency to QSY to 144.125 if a QSO is intended. A brief description of the possible benefits would be desirable. The matter has been discussed with a number of local stations and none have expressed objection.

"It is not proposed that the suggested frequency become part of some official band plan, common acceptance is all that is required."

Thank you for writing Angus, and your proposal is given some publicity here. I would be pleased to hear from anyone on the matter. In the short time I have had to consider the suggestion, I cannot see anything wrong with the idea. In the past, there have been moves to have people shift up 10kHz, or down if you chose, but this has not always been successful because plenty of stations can still cause QRM to a weak signal on 144.100 from 144.110, particularly in the capital cities. Not everyone has clean a transmitter, and not everyone has a receiver which will handle cross-modulation, or sheer overload of the front end. At 25kHz separation there is more chance of successful operating by the parties concerned. It also does not need too many turns of the dial, which seems to be a problem in some shacks! My only concern could be that the 25kHz spacing could be carried over into the FM area, where it is known that 25kHz is still close enough to cause some repeaters to trigger with unintelligible, or no information, when line-of-sight signals to a repeater may be 70dB, or more down, but still strong enough to fire up the repeater.

Anyway, what about trying the idea during 1986 and see what happens? For those in the shack and monitoring, and with so many transceivers around with scanning facilities, it would not be a problem to cover both frequencies on a regular basis. The use of 144.125 would indicate to the listener that the station calling was available for a contact, whereas on 144.100, at the moment, when one hears a station calling CQ DX and not getting an answer, you wonder whether you should inquire if he wants a contact or leave him alone to call again later. **Your thoughts please!**

TASMANIA

Good to receive a note from an old friend of mine, Col VK7LZ, a VHF operator of many years standing. He said he had to change QTH two years ago at the Tasmanian Government's 'request' to make way for a new north/south, four lane highway. Not being a young man, the move was rather traumatic, and he has found it difficult to erect suitable antennas for the VHF bands, but does hope to get back on six metres this year. He has had to content himself with a couple of small antennas for satellite usage.

All your VHF friends will be looking for you this Es season Col, and I hope you are able to renew some of your old friendships. Like you say, it is hard to get VHF out of your system, whatever happens!

While still in Tasmania, a message from Joe VK7JG indicates he too is still well into VHF operation, and is able to keep regular nightly contacts on two metres with David VK3AUU. He has also been trying to make the distance to Sydney on the Saturday and Sunday morning scheds. Joe says it will only be a matter of time before this is achieved.

SCATTER CONTACTS

As a result of some telephoning and word-of-mouth messages, an exercise was set up in four States for Monday morning, the 28th October, to try and contact one another via what was initially thought to be a possible meteor enhancement period, but which in fact turned out to be normal conditions.

Doug VK3UM, was the master of ceremonies, and the following stations were set up for the exercise: *144.200 — VK7JG and VK3CAD to contact VK2ZAB and VK1BG; 144.250 — VK5LP and VK3AUU to contact VK4LC and VK4YJH; 144.300 — VK3NM and VK5ZDR to contact VK4KJL and VK4AGQ; 144.350 — VK3UM to contact VK2AKU and VK4GC.* Subsequently, VK5DK and VK4ZML joined in the operation.

The first named stations were to call during the first 10 seconds of the minute and listen during the next ten seconds, when the other stations would be calling. Synchronised time was to be used, and commencing at 1800UTC (4.30am in South

Australia), and to continue for an hour, frequencies to be set accurately and preferably the equipment left on all night to finally stabilise.

As a result of all this setting up, contacts did actually result, despite no enhancement of conditions. VK7JG contacted VK1BG with eight pings giving signals to 5x9; at 1852 contact was made the other way round; VK2ZAB heard VK7JG; VK3AUU was heard by VK4YJH, but not worked; at 1808 VK4AGQ exchanged 599 reports with VK3NM; VK3UM contacted VK4GC. However, there were no contacts or hearings from the VK5 end, and it was agreed later it may have been too early for our more western position. Lionel VK3NM reported hearing Channel 0 strongly for up to half a minute, but was inaudible at the time he worked VK4AGQ.

It appears not to have been a waste of time, judging by the contacts which were obtained, even if VK5 did miss out. After the exercise, reports were exchanged on 3.690MHz, so all knew soon afterwards what had occurred. Suggestions are that the exercise could be repeated between 10-14th December, when there could be enhancement from a meteor shower. The prime requirements for involvement as far as Doug is concerned are — reasonably well-set-up stations are required, capable of stable operation on an accurately set frequency, the ability to keep to a set transmitting and receiving schedule, and reliability. That is to say, if you say you are going to participate then you will be there and not have the other end calling, with no hope of a contact.

On behalf of the group I would like to thank Doug VK3UM for all his work in setting up the schedule, and I hope it will lead to bigger and better results. Just as a matter of interest, Doug did say he observed 10 minor pings, one medium ping, and one good ping occurring around 1810, 1814, and 1858, but mostly after 1830.

TWO METRES TO INDONESIA

From 'The West Australian VHF Group Bulletin' for October, comes the news that Brian VK6AIH, at Port Hedland on the NW coast, reported he had a long QSO with YD9GLJ from 0955 to 1026, on 2nd October 1985. A lot of local chatter was heard on 144.970MHz, and Brian caused a frantic search for an English-speaking operator when he called. The distance is about the same as Melbourne to Brisbane.

This path has been open in previous years, but this is the earliest known opening and promises an interesting period ahead. It certainly only takes one contact like this to keep operators at both ends more vigilant on the bands. Good work.

SIX METRES

This band has been remarkably quiet for a long time, but it did crackle into life for a while during the early evening (SA time) on 4th November, when the band opened to VK6. This info came in a phone message from Bob VK5ZRO, but I was out at the time. Oh well!

Those of us who have been on the VHF bands for a long time tend to think everyone knows about propagation, but I was reminded this was no so recently when a newcomer, over a cup of coffee, asked for some explanations, particularly in regard to sporadic E, or Es as we call it, on the six metre band. Perhaps there are others who could accept a brief comment about what causes some of the long distance contacts we have from time to time. Please bear with me Roger VK2ZTB!

Those who were active on six metres from about 1979 to 1983 would have noted how exotic stations could be worked from places many thousands of kilometres distant. In fact, approaching half-way around the world at times, particularly in the Northern Hemisphere. This was not Es, but F2 propagation, the F2 layer, which is ionisation formed by ultraviolet radiation from the sun, the amount varying according to what part of the solar cycle we are in at any time. When there are fewer sunspots, as at the moment, the radiation is lower than in years of high solar activity. We are currently in a very low spot, so we don't expect much F2 for the next three or four years, at least. Later, when the F2 layer becomes more ionised, it will reflect back frequencies much higher than it will now, the fall-off starts at around 15 metres, and worsens as we go higher in frequency. The last Cycle 21, which we recently passed through, was quite a good one, whether the next will be as good, better or worse is rather hard to determine in advance. But, peaks of sunspot activity usually occur somewhere around a period of eleven years, give or take a little. F2 propagation usually produces single hop contacts at about 4 000km and multi-hop, which can be multiples of that distance stretching around the world.

Sporadic E, or Es, commonly produces contacts up to 2 000km, which are single hop, but it is possible to have Es contacts, depending on the density of the E layer at distances much closer, even 600 or so km. The difference in distances between the hops of F2 and Es is due to the height of the layers above the earth. F2 can be 300km, and Es about 100km. Multi-hop can occur with Es too, eg VK5 to ZL is about two average hops, and instances have been recorded of distances greater than this.

Es, or the sporadic nature of the E layer, is not completely understood yet, and it is still very difficult to predict accurately when Es contacts will take place. What is known is that Es propagation is more common in the summer months, mostly November, December, and January, and again for a lesser period during June and July. There are many recorded instances of contacts via Es being made at any time of the year, right out of the "blue" the band on six metres will open for a few seconds, maybe a minute or two, half-an-hour, or for several hours, so sporadic is it that we cannot tell how long the band will be open for. It would be best said that at times of making Es contacts, other than during the summer, you should keep your overs short, because the band can fade out in a second or so, and consequently, that's the end of your contact! In the summer period, it is not uncommon for six metres to stay open to somewhere all day, and well into the night, often the area being worked follows the passage of the sun.

There seems evidence now to suggest there are several types of Es propagation, with one known as mid-latitude Es, which appears capable of forming, as a result of thunderstorms, and generally rough weather patterns, eg cyclonic disturbances, etc. The higher the storm, the more likelihood of propagation it seems. The Es pattern, or propagation, appears to be fairly independent of solar activity. In fact, the Es turn up every year whatever period of an eleven year cycle we seem to be in; but there is some evidence to suggest Es does produce openings of extreme intensity, and for very long periods at any one time, during the low part of the cycle. Because of its sporadic nature, one has to be careful not to be too definite in making such statements, and those who don't agree with such statements also need to be careful, because there is not a lot of proof either way, but it is being worked upon!

All of the foregoing may be a bit vague for some, but suffice to say to the new operator on six metres, Es can appear at any time, it can last for a short period, or for hours at a time. The directions from which you can work stations will change throughout a day of activity. It may swing from VK4 to VK6, then VK7 and perhaps back to VK4, etc. As a general rule, keep overs reasonably short, and be prepared for signals to dropout quickly. Around 1 700 to 2 000km is considered about optimum for most conditions, but 200 to 300km either way doesn't seem to affect signals much at times. Except when the level of ionisation is increasing or decreasing, the signals can be very strong indeed, one watt can be S9 + at 2 000km.

From time-to-time, you will notice that it becomes possible to work stations quite close, say 600km, or just over the State border, etc. This is known as "short-skip" and stations are generally very strong indeed, and indicates a very high level of ionisation, allowing the maximum usable frequency (MUF) to rise, often over 100MHz, and occasionally into the 144MHz band. Experienced operators are always on the lookout for "short-skip" with strong signals, and invariably they have a look at the two metre band, where contacts can be made via Es, mostly for shorter periods than on six metres, but again with very strong signals and with distances to 2 000km, or more. And on two metres, you don't fool around wasting time with unnecessary chatter, you hop in and exchange signal reports very smartly because the band may only be open for a few minutes.

Finally, one other phenomenon you will find is a warbling type of signal, generally weak, but mostly intelligible with careful listening. This is known as "back-scatter" and is a case where you may be working from, say VK5 to VK6, and you hear this strange sounding signal from VK4. Because it is weak, you turn the beam around and the signal disappears, the only way you can hear it is on VK6. Strange? Yes! But it seems the VK4 signal is being reflected around the E layer quite a bit, before coming down and it would seem to be reaching you by reflection from the layer, which is probably ahead of you on the VK6 path.

That is a brief outline of what happens. It will not satisfy a lot of people, but I have tried to keep the language plain, and hopefully understood. Es provide a great deal of enjoyment for VHF operators, and if it were absent I am sure band interest would suffer. Suffice to say, it is possible, on a good Es day, to work all Australian States, all New Zealand call areas, and a few Pacific countries as well. Such days are not common, but most years do produce some periods when such contacts are possible. The rest of the time we need to be content with contacts to, say two or three States, or maybe only one, but the unknown nature of what is going to happen next keeps our interest.

Closing with the thought for the month: *"Notice how no one talks about two living as cheaply as one any more. That's because it is barely possible for one to live as cheaply as two."* All the best for 1986. 73. The Voice in the Hills.

AR

The Astrologer Galileo, first sighted Jupiter's Satellites through his makeshift telescope on 7th January 1610.

How's DX?

Ken McLachlan VK3AH
Box 39, Mooroolbark, Vic. 3138

It has been customary for this column to feature a well known DXer, as a guest writer, at the commencement of each year. It has taken a lot of endeavour to persuade one of our country's identities to express her thoughts on the hobby, as she has seen it through the period of in excess of half a century, due to her nature of not wanting tc discuss her achievements.

The person is no other than Austine VK3YL. Austine was licenced on the 13th May 1930 and her introduction to the hobby came after a sojourn in hospital for a tonsillectomy.

My first question to Australia's longest living active licenced YL, was how did you become interested in the hobby? The answer was *"I don't know where my interest really came from, but after a tonsil operation and whilst recuperating, my Uncle Rob asked me what I would like? The prompt answer was, a wireless set. Duly the wireless set arrived complete with two poles for the antenna! I was enthralled and soon began building crystal sets, later expanding my techniques to building DC receivers, but the little crystal sets were just great. I have very vivid and fond memories of staying up late to listen to Queen Wilhelmina of Holland, in a broadcast and other great events of those days.*

"Using a valve receiver, I tuned into the amateur broadcast band and heard Chris Rainbow VK3JR. I sent him a SWL card and included with his reply was an invitation to come over and see his station. That was really the commencement of my real interest in the hobby. Chris formed classes for the AOCP, which I attended. During this period Will, now my OM, came to my home, after hearing about my new interest, to assist me in mastering the Morse code and general theory. Will had vast electrical experience, due to his profession as an electrical engineer, employed with the State Electricity Commission of Victoria".

The next question that was posed to Austine was equipment. Did she buy or build? *"Bought equipment was almost non existent and we scrounged parts from various shops that catered for the new medium around Melbourne. What we couldn't buy we improvised and made. Crystals were a problem due to availability and cost. I ground mine from old quartz lenses obtained from spectacle shops. This was achieved by grinding with different grades of emery powder on plate glass to the desired frequency. Not always easy, as the properties and cuts of the acquired quartz were not known".*

Wireless Weekly on Friday 3rd April 1931, features a story and picture of, the then, Miss Austine Marshall and quoting a couple of excerpts from the article seems appropriate. *"The writer was informed that quite a lot of our respectable local 'hams' seem to be budding Romeos and during a contact they invariably ask for a photo! As they send a photo of themselves in exchange Miss Marshall has quite a Rogues Gallery, showing the outfits and operators of about fifty stations".*

"Her station, at 650 Dandenong Road, Murrumbeena, is the rendezvous of several of the local boys at least one night per week and any visiting amateur from other States and overseas is always assured of a hearty welcome".

Another excerpt which all amateurs have endured I am sure is also worthy of mention. *"Miss Marshall says: 'When the first station I ever called came back to me, I was almost too excited to key' ".* Brings back memories does it not?

Many years ago during a chat I had with Will, he intimated that it was quite a sight to see Austine, wielding a soldering iron to manufacture or repair a receiver or transmitter. Unfortunately no photographs are available, but one must remember that the soldering equipment and aids available today were unheard of in this period. How would one go in this age of technology, soldering a 48 legged IC into a circuit board with an iron heated on the kitchen gas stove? Not very well, I should imagine!

Austine, became the first and only YL to join the Royal Australian Air Force Wireless Reserve in 1934 and all reservists were divided into various sections of six members/stations. As Austine says *"each member took the responsibility of being Section Commander and we handled thousands of messages overall. I was also District Commander on many occasions and won my share of awards".*

Austine, as pictured in Wireless Weekly. (Note the WIA Badge).

The insignia of the RAAF Wireless Reserve in 1934.

Austine's RAAF Wireless Reserves call sign was 3D6 and her section was VMC4 and she proudly quotes from RAAF Wireless Reserve Notes (AR January 1937) which reads *"3D6 deserves hearty congratulations, not only for winning the Station Trophy but also for the section win to VMC4, which was due in no small measure to the work and initiative of this station".* Austine modestly remarked that the competition was very keen and they won by only a few points.

This lady, a Life Member and Pacific Director of the Old Old Timers Club (OOTC), a pioneer life member of the Society of Wireless Pioneers (SWOP), whom she still keeps regular schedules with members in a 'shack' surrounded by mementos, trophies, and some rare certificates including the DUF 4 Medal and certificates, first YL to receive WAC-YL, third YL worldwide and first VK to achieve WAZ, Yasme Award Certificate (number 7), being a Foundation Member, YL-DXCC from the Canadian Ladies Amateur Association, first VK to receive the ALARA Certificate, and one of the few YLs in the world to display the prestigeous Arabian Knights Award, one condition to the obtaining of this award is to have QSOed His Majesty King Hussein of Jordan, JY1.

Austine, who has other interests apart from amateur radio such as golf and philately, does not remember when she first caught the DX 'bug' or when she achieved her DXCC, but she is near the top and is on the ARRL Honour Roll, no mean achievement, considering that until recently she ran modest power to a dipole and was wholly CW. It is only over the last decade that SSB has become a mode that she has used together with a beam that was erected by her OM Will, at their QTH, on an eight lane highway, the busiest in Melbourne. Austine's QTH has always been on this highway, but at different addresses.

Austine is still 'microphone shy', as she is only occasionally heard on this medium, still preferring her inaugural love of CW, with a straight hand key. When asked if being a YL, gave her an advantage, her reply was *"No, I just felt like one of the boys".*

Austine, is quick to remind readers that when operating in the early days, it was not a transceive operation, one would call CQ and then search the entire band for a reply and the power limit in those days was 25 watts input. Her first rig was a TPTG with a UX210 tube and the three tube receiver, consisted of a detector and two audio stages. The antenna was a full 20 metre Zepp.

Looking back on her first log, this lady reminisces of the 19/12/1931. She says *"I QSOed HC1FG and that country gave me WAC, was I happy; then I QSOed KGEG, the yacht 'Northern Light' from the USA and GX2TM aboard the MV 'Daga', with its registry in London, what a day! When the vessel arrived in Melbourne, the Captain, Wireless Operator Tom Miller and the ships medico visited me! It was quite a thrill".*

At the commencement of WWII, when all amateur stations were closed down, Austine taught Morse code for the WIA, at the rooms in Melbourne. At the cessation of hostilities, amateur radio was to the fore, this time with Type 3 Mark II war surplus equipment that used the familiar 6L6 tubes and weighed about 22 kilograms, this rig lasted for many years operating on the 20 metre band. Needing crystals, it was back to the grinding process again and over a period there was quite a stock but not enough to cover the entire 20 metre band of course.

Austine who has been a WIA member since before being licenced says *"that each award has given me great pleasure and to answer your question of the greatest thrill I have had from the hobby is hard, but I feel my involvement in the RAAF has been the highlight of my amateur career so far".*

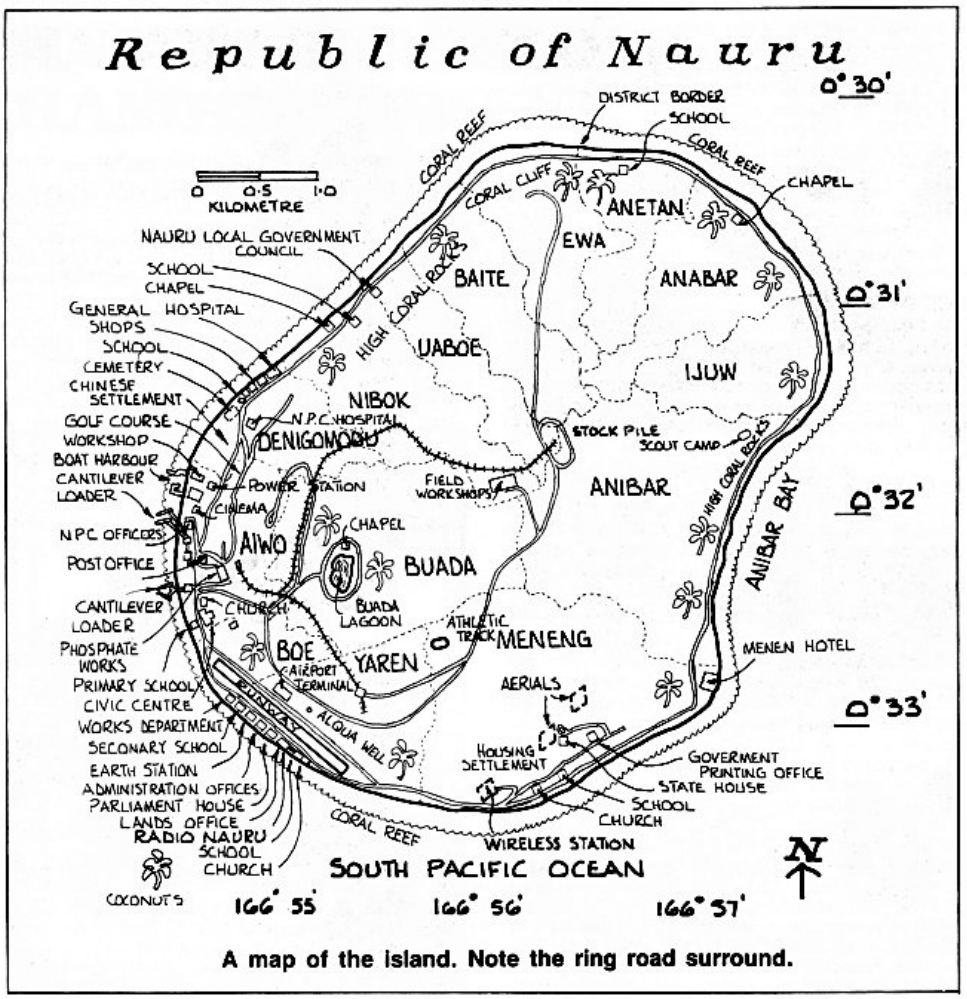
Quite a history for a lady that has spanned in excess of half a century with a hobby that has brought her lasting friendships worldwide, believes patience and persistence have allowed her to achieve the goals she has set herself, and asked if knowing what you know now, would you do it over again. The unpremeditated answer in Austine's own words was *"I would do it all over again DX wise and otherwise — you see I never tried to ever put radio first, it was my hobby and I still want a country or two, if not on CW, then on phone".*

Quite a history Austine, unfortunately space doesn't permit elaboration of many other facets of your hobby career, but long may you 'pound the brass' and be heard on SSB, seeking the DX that you deserve, with the continued encouragement of the OM, Will. These personal sentiments I am sure are supported by all readers of this column and DXers world wide. Congratulations on your contribution to our hobby.

NAURU: THE FUTURE?

The President of the Republic of Nauru, His Excellency the President, Hammer de Roburt, GCMG, OBE, MP, in a recent television interview, spoke of the problems facing his people in the next decade.

Originally named "Pleasant", because of its lush appearance, by an English explorer in 1878, this island was annexed to Germany in 1888 and



A map of the island. Note the ring road surround.

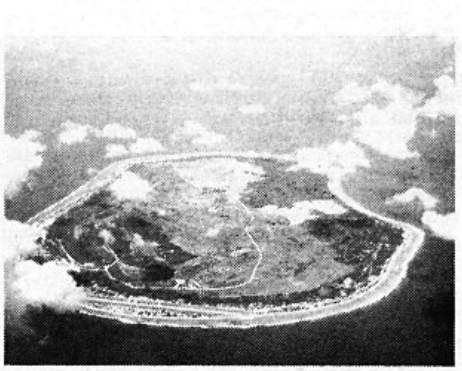
since has had quite a chequered history, including being annexed to Australia on two occasions, until it was granted independence and created a Republic in 1968.

Nauru, generally hot and humid, with an unpredictable rainfall of 2000mm annually, is surrounded by a flat coastal belt approximately 150 metres wide, fringed by a 200 metre coral reef. The island is of volcanic origin and rises 4800 metres above the sea bed, having an average height of 50 metres above sea level. This Republic, on looking at a map, is seen as a dot located near the equator in the vast Pacific Ocean, having an area of 20 square kilometres and a population in the vicinity of 7250 which is made up of twelve different races, mostly of Polynesian and Micronesian descent, settled in the districts of Ewa, Anetan, Anabar, Ijuw, Anibare, Meneng, Yaren, Boe, Aiwo, Denigomdou, Nibok, Uaboe, Buada and Baite. Each of these races are symbolised by a point of the star depicted on their national flag which is coloured blue with a gold band across the middle, representing the equator and a twelve pointed star depicted in white in the bottom left hand corner.

This Republic, one of the world's smallest and probably the richest, boasts its own airline that has grown to service adjacent islands and is now in its fifteenth year of operation. Apart from civil aviation, shipping interests have not been neglected. The Government Council owns and operates a number of vessels, including cargo passenger liners, bulk carriers (one with a specialist tanker facility for carrying the island's petroleum requirements). Also under the auspices of the Nauru Fishing Corporation, which is government owned, specialist fishing boats are pressed into service to tap the rich adjacent fishing grounds.

The source of the phosphate deposits has not been established beyond doubt, however the hypothesis is that the island's deposits are from marine origins, where organic matter (plant and animal remains and fecal pellets) in highly fertile tropical waters sinks to the sea bed, and the decay of these remains form phosphate pellets in the sediment, which is already rich in minerals.

The area has been mined since the turn of the century, when the royalty to landholders was in the vicinity of one half penny per ton. In a period of five years it is estimated that 630,000 tons was shipped out for a sale value of 945,000 pounds sterling. Royalties for the period were 1320 pounds. Mining has continued with a presently estimated extraction of 1,750,000 tonnes annually, until there is very little left of the third of the island that has been set aside for claiming the phosphate. Over 60 percent of the revenue received is invested in long term trusts. One such investment is the unusually designed magnificent 52 storeyed building, Nauru House, located in the centre of Melbourne. What is left of the mining area is unusable undulating crannies and nooks that are useful for nothing, except probably for playing "hide and seek", if you feel that way inclined.

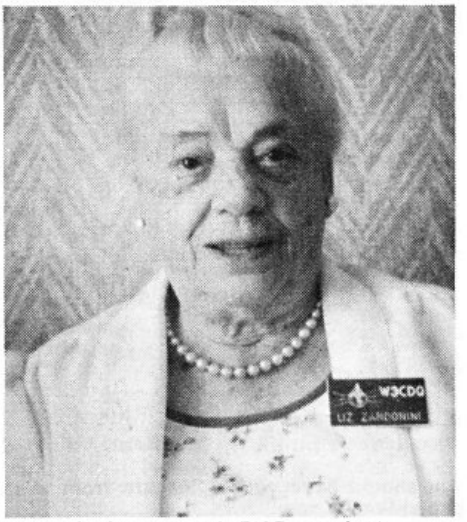


Nauru, as seen from the air.

Communications on the island have improved since the Republic installed a satellite earth station in 1975, giving access to the world via Australia and Hong Kong. International telex, telegraph and telephone links operate around the clock as does a 1200 line automatic inter-island telephone. Recreational facilities are excellent, including fishing, tennis, basketball and even Australian Rules Football is played.

It appears that the Republic, due to nearly having exhausted its main exportable product, phosphate, is very concerned as to what the future holds and the administrators are looking for alternate accommodation for their people, by trying to buy an island that will not drastically change the lifestyle of its small population.

In the future, will the prefix C21 become a rarity or a call of the past and will another prefix be heard on the amateur spectrum? Only time will tell.



Liz W3CDQ (see How's DX December).

A DX CLUB TO JOIN

A DX Club, with in excess of 400 members, has opened its doors to overseas amateurs. This club has a most comprehensive QSL directory, programmes for computers, books and information on awards and contests, to name but a few of their services.

All one has to do to apply for membership is to write, enclosing 1 IRC, (I recommend 3 in this instance), to Mario Ambrosi, I1MQP, ARI DX Club, via Stradella 13, 20129, Milano, Italy.

COMPANY

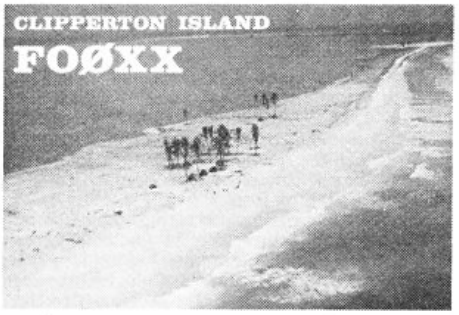
Les 7Q7LW, has some company. G3TBK is in the country and expects to be QRV for several months. It seems that he may pool the equipment he has with Les and operate from his QTH. Remember, Les 7Q7LW's XYL loves to receive stamps when you QSL to him.

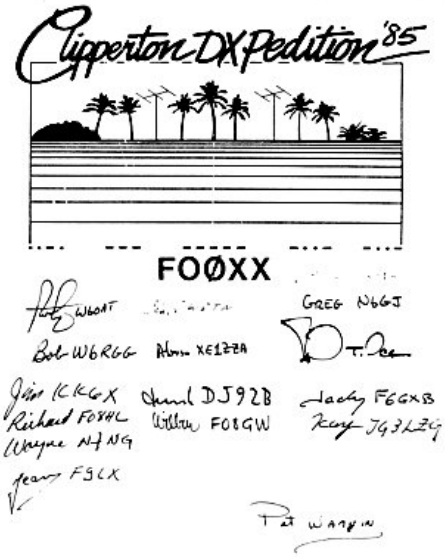
COUNCIL OF EUROPE: CALL TP2I

The Council, based at the 'Palais de l'Europe' in Strasbourg, France was formed in 1949 and comprises the countries of Austria, Belgium, Cyprus, Denmark, the Federal Republic of Germany, France, Greece, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

The Committee of Ministers, comprising the Foreign Ministers from each member country, who hold the chairmanship in turn, strive for the protection of democracy, human dignitity, improvement in living standards, protection of fauna and flora, safeguard of the architectural heritage and provision of facilities for the younger generation with training and sport to mention but a few of their aims. They conservatively represent the interests of some 385 million Europeans.

The amateur station is managed by F6FQK and QSLs are handled by F6EYS. The address is TP2I, C/- Council of Europe, BP 431/R6, 67006 Strasbourg Cedex, France.





You should have your QSL card from this Expedition by now!

WARC BAND INCENTIVE

The WARC 24 MHz Band has had a "shot in the arm" with the inception of the 12-12 WORLDWIDE CLUB. Charter Membership is available until June 1986 and to qualify you must make contact with a 12-12 Director or official station. After this date, one will be required to work 12 members and request their lifetime numbers.

A Newsletter, on a quarterly basis, is available as one of the benefits. Further information may be obtained by writing to 12- 12 World Wide, C/- Steve Walz, WA5UTO, PO Box 222, Cherokee, OK 73728, USA with a SAE plus a couple of IRCs.

YI8BGD

The operators apparently are being allowed more freedom in what they can do. Quite a few are quoting individual box numbers for QSLing, **but** pay attention to the box number they quote and each individuals name as they will be the only ones that hold the logs for that operation. Also remember, IRCs are the correct order of the day for this country.

QSL CARDS ABANDONED? ?

I was horrified to read in the VK4 mini magazine 'QTC' for November last year, the staggering number of amateurs in that state who had cards waiting for them at the bureau. I lost count after I got past the 465 call signs that were on the published list.

One cannot but wonder if it is worth QSLing if this is the apathy that is shown and could it be typical in this country or world-wide? A quick check with the VK3 Bureau showed that in excess of 30 000 cards have been uncollected over the last five years. What happens in other states or countries we are unaware of, but this may generate some feed back which I will be passed on to the readers.

LET US GET IT RIGHT

The following are the correct QSL addresses for some of the stations operating out of BY-land.

BY0AA PO Box 202, Wulumqi.
BY1PK PO Box 6106, Beijing.
BY1QH PO Box 2654, Beijing.
BY1SK PO Box 2916, Beijing.
BY4AA PO Box 205, Shanghai.
BY5RA PO Box 730, Fouzou.
BY5RF PO Box 209, Fouzou.
BY8AA PO Box 607, Chengdu.
BY8AC PO Box 607, Chengdu.

After each address the wording of Peoples Republic of China should be added.

It is interesting to note that BY0AA is located in Xinjuan Uygar which is within the borders of the rare Zone 23, a helpful one for WAZ.

FCC BUSY

The Federal Communications Commission in the United States apparently is quite busy in the courts, who have been handing out some hefty fines for use of excessive power, out of band operation and illegal use of the amateur band. Many other prosecutions are being prepared and pending court appearances.

ALCATRAZ

If you worked W6AK on the 5th and 6th of October last year, it was the Sacremento Amateur Radio Club operating from Alcatraz Island. A special QSL card has been struck and is obtainable from SAC, PO Box 161903, Sacremento, CA 95816-1903, USA. A SAE and 2 IRCs should suffice.

ODDS AND ENDS

Laydoh 1Z9 is operational again, but still doesn't count for DXCC. * * Alain 6W1HB/7O, hopes to be back and 'operational' again until March. He also, doesn't count for DXCC at the present. * * More TAs expected on the bands soon, after the recent examinations that were held. * * The 'Globetrotting' Colvins quite active on CW and SSB from the African Continent. * * New station from the Peoples Republic of China is BY4AOM and signals emanate from the Shanghai Institute of Electronics. * * TR8JD claims to be the QSL route for all TRs. * * If the BYs operate from Pratas Island it should not count for a new DXCC Country as it is only 210 km from the mainland and under the Peoples Republic of China administration. * * 10MHz enthusiasts watch for K0WTM/HC1 around 10.101 to 10.104 MHz. * * T2WWL and T2MPL, Ward and Madge Little who are missionaries have become active from Tuvulu. * * 5N25RTF was used to celebrate 25 years of Independence. QSL to DK2IF. * * DK5CQ/VK9L hopes to be active until at least the end of February. * * C53FA, who is DJ9EH, hopes to be QRV until July in his off duty time from Radio Gambia. * * Two new member countries to the IARU are the Kuwait Amateur Radio Society (KARS) and the Brunei Amateur Radio Society (BARTS). The IARU membership now stands at 81. * * The QSL Managers for the 7S activity from Sweden are still awaiting the printing of the special card.

THANKS

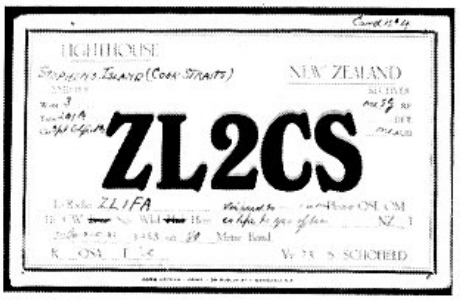
Sincere thanks are extended to the following: The Editors of weekly, bi-weekly and monthly newsletters including the ARRL NEWSLETTER, BARG, CQ-QSO, DX FAMILY FOUNDATION NEWSLETTER, JAN and JAY O'BRIEN'S QSL MANAGER LIST, KH6BZF REPORTS, LONG ISLAND DX BULLETIN, QRZ DX, RSGB DX NEWS and THE WESTLAKES AMATEUR RADIO CLUB NEWSLETTER. Magazines including, BREAK IN, cqDX, JA CQ, JARL NEWS, KARL NEWS, QST, RADCOM, VERON and WORLD RADIO.

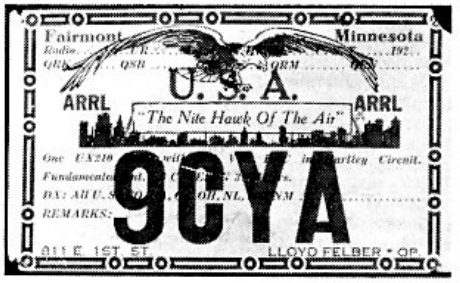
Members who have contributed include VKs 2HD, PS, EBX, 3YJ, YL, and G3NBC. Overseas amateurs include G1EOD, KB6OAW/KH2, ON7WW, W3CDQ, WB6GFJ and ZL1AMM. A HAPPY NEW YEAR and thanks to one and all.

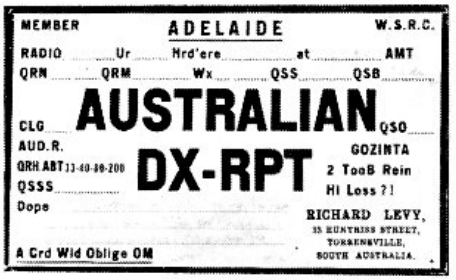
AR

QTHs YOU MAY NEED

3D6BD	Eric Engen, 2804 Spencerville Road, Burtonsville, MD 20866, USA.
3B9FR	Franz Langer, Carl Kistnerstr.19, D-7800 Freiburg, FRG.
4S7VK	Same as 3B9FR.
6W1MS	PO Box 950, Dakar, Senegal.
8Q7AV	Noel Lokuge, "Four Winds", Majeedi Road, Male, Maldive Islands.
9M2MM	Operator Mark only: PO Box 10035, Kuala Lumpur, Malaysia.
9Y4KB	PO Box 1167, Trinidad.
A24SC	Steve Craggs, High Pitt Rd, Cramlington, Northumber, UK.
A71AD	PO Box 4747, Doha, State of Qatar.
A71BK	PO Box 1556, Doha, State of Qatar.
BY1QH	PO Box 2654, Beijing, People's Republic of China.
CE0FFD	PO Box 4, Easter Island, via Chile.
CE0FQV	PO Box 59, Easter Island, via Chile.
ED1ISI	Jose Suarez Souto, Cores, Puenteceso, La Coruna, Spain.
FO8JP	Daniel Taquet, La Petite Rue, F-02170, Esqueheries, France.
FY5BO	Guy Faubert, BP 856, F-97303, Cayenne, French Guiana.
HC8E	PO Box 289, Quito, Ecuador.
KA8GVS/ KH2	315 Horne Street, NCWP, Guam Island, FPO, San Francisco, California 96630 USA.
KC6IN	PO Box 296, Ponape, Eastern Caroline Islands, 96941. USA.
TA1C	PO Box 188, Istanbul, Turkey.
TA1D	PO Box 167, Istanbul, Turkey.
TR8JYC	PO Box 2E827, Libreville, The Gabon.
TT8AQ	Jacques Calvo, BP 70, F-91605 Savigny Cedex, France.
VP2EZ	J White, General Delivery, The Valley, Anguilla.
ZD7XY	PO Box 54, St Helena Is, South Atlantic.







Antique QSL Cards courtesy of Peter Wolfenden VK3KAU

KNOW YOUR SECOND HAND EQUIPMENT

A Series to Help You Identify Amateur Equipment

This month, and next, we will conclude our look at the early Yaesu equipment for the time being. However, we will return to the Yaesu stable later in the series to discuss more of their prolific output.

YAESU FT-75 TRANSCEIVER

First announced in Australia in August 1972, the FT-75 was, to say the least, different. It was an all-band 80 to 10 metre transceiver with an advanced design solid state receiver and exciter, with a valve driver and final stage using a 12BY7 and 12DQ6B. Power output was in the order of 30 watts.

Both transmit and receive frequencies were crystal controlled, but these could be shifted to some extent by a VXO circuit. There was provision for three crystals for each band and a total of fifteen could be installed. For the time, the FT-75 was very compact, measuring 80 x 210 x 300mm and weighing 3.8kg.

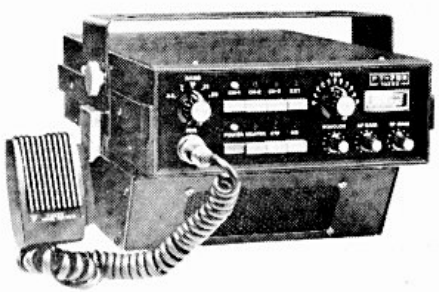
As a tube final was used, a power supply was required for both AC and 12 volts operation. These were housed in separate cabinets the same size as the transceiver and a stacking type mobile mount was available. For home station use with the AC supply, it was possible to team the FT-75 with the FV-50 series VFO to give full band coverage. However, the FV-50 was not noted for its stability and results were not always satisfactory.

In its original application, as a mobile transceiver, it could still prove most useful, so long as you could put up with three slightly plus and minus frequencies.

Original prices were: FT-75 Transceiver $296. FP-75 AC power supply $53.50. DC-75 12 volt DC power supply $53.50, and the FV- 50C VFO was $49.50. Second-hand value today would be around $175 for the entire group. A review of the FT-75 appeared in the September 1972 issue of Amateur Radio.

YAESU FT-75B TRANSCEIVER

Released early in 1974, the 75B was very similar to the earlier FT-75, however, power output was doubled by the use of two 12DQ6Bs in the final. With extra power, the power supplies were up-rated. Prices were the same as the FT-75 initially, but later in its popularity the FT-75B actually dropped in price to $238. Second-hand value today would be about the same as the FT- 75.



The FT-75 with mobile mounting bracket and DC-75 power supply.

The FT-75 with FP-75 AC power supply.

YAESU FT-2F TRANSCEIVER

This 2 metre FM transceiver was released in early 1971. I well remember the first time I saw an FT-2F unit. Having been used to the ex-commercial, tube-type FM transceivers, I was amazed that it could all be fitted into such a compact box. The FT-2 was a 12 channel transceiver with 10 watts RF output, and of course, was fully solid-state. An 'S', come relative output meter, balanced the channel display on the other side of the channel selector knob.

A set of transfers was supplied so that the appropriate frequency could be attached to the dial. Two crystals were required for each channel, a 6MHz for the transmitter and a 45MHz for the receiver. The transmit crystal has a trimmer to enable the frequency to be set, but the receive crystal could not be stabilised. This, in fact, was the greatest problem with the FT-2F. As the crystals aged, they gradually drifted off frequency, producing both poor audio quality and incurable ignition noise under mobile conditions.

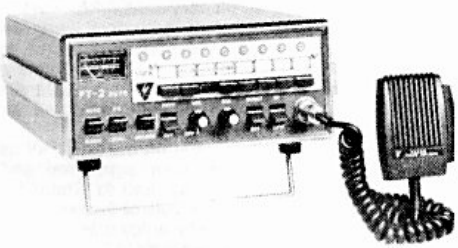
Price when new was $269, with three channels supplied. Second-hand value today would be about $60, depending on the number of channels installed.

YAESU FT-2FB 2 METRE FM TRANSCEIVER

The FT-2FB has the same appearance as the FT-2 and was introduced to the Australian market in August 1972. The 2FB was improved in many aspects, when compared to the FT-2. Both the transmit and receive crystal frequencies were revised to improve stability, and to give the facility to net the receiver to an exact frequency. Transmit crystals were on 18MHz and the receiver on 15MHz. In fact, the crystals were inter-changeable with the Icom IC-22 series crystals with just a very slight modification to the padder capacitor values. As Icom crystals were always easier to obtain than their Yaesu equivalents, most FT-2FBs were modified in this way, and 12 crystals were available.

The FT-2FB was capable of excellent performance with receiver sensitivity only slightly down on current two metre equipment. Audio quality on both transmit and receive was excellent. A matching AC power supply, the FP-2AC was an option for the FT-2 and FT2-FB.

Price when new with three channels installed was $259. Second-hand value today is about $85, again depending on the number of channels installed. Extra channels over about four or five would be worth about $5 each, as long as they are of use to you.



YAESU FT-2 AUTO.

The FT-2 Auto is an FT-2FB with a built-in AC power supply and a channel scanning facility for eight channels — quite a useful facility if you need to monitor a few local FM frequencies. All other features are similar to the FT-2FB.

Price when new, with three channels installed was $398. Value today would be about $100.

AR

Next month we will take a look at the various models of the infamous Yaesu FT-101.

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

Another year has come and gone, and as 1985 fades away into the distance, it seems a good opportunity to look back over some of the outstanding occurrences in ALARA's tenth birthday year.

It has been a most important milestone when we consider our very small beginnings on 26th July 1975, which has been admirably documented by Mavis VK3KS, in her History of ALARA.

In those days, licensed YL operators were few and far between, but during the ten years of its existence, ALARA has grown from a mere handful, to over 200 members, active in all facets of amateur radio, and justly proud of their achievements.

While giving ourselves a pat on the back, let us not forget the OMs who have supported and encouraged us along the way, and to whom we would like to extend a sincere vote of thanks.

To mark the occasion, very enjoyable birthday lunches and get-togethers were held in VKs 2, 3, 4, 5, and 6, with participants voting to hold similar functions in the future. (Well, we don't really need an excuse, do we?)

A birthday mini-contest was held on 6th July and was won by Kim VK3CYL, with Gwen VK3DYL, a very close runner-up.

During 1985, ALARA members were involved with many activities, including WICEN, JOTA, Educational Programmes, and CW Sessions.

On 6th January 1985, YL Activity Day, VI3WI was activated on a roster basis by VK3 YLs.

Gill VK6YL, and Christine VK6ZLZ, were active in the John Moyle Field Day Contest from Penguin Island, 50km south of Perth. In the same contest, Bev VK6DE, and a group of Geraldton amateurs, operating from a beach, were interviewed for a local paper.

Helene VK7HD, was interviewed by the ABC about YL interest in amateur radio, and was assisted in demonstrating operating procedures by several ALARA members.

At the Tasmanian Amateur Radio Convention, ALARA members operated a highly successful publicity stand, and were allocated the call sign VK75A for one hour each day. This call sign was used by Connie VK4ATK, on 12th August.

Grace VK7NNN.

WIA 75th Anniversary Book Pack Presentations were made on behalf of ALARA to the Regency Park Centre for the Young Disabled by Jenny VK5ANW, and Marlene VK5QO, and to the Dalby Agricultural College by Margaret VK4AOE.

Margaret was also interviewed on television for the programme "Here Tonight".

Joan VK3NLO, appeared on local television to speak about and demonstrate amateur radio.

Many members were active in amateur radio organisations, notably Jenny VK5ANW, WIA (SA Division) Councillor, Gill VK6YL, Secretary of WARG, Christine VK6ZLZ, WIA (WA Division) Councillor, Diane VK6KYL, Secretary of Goldfields Radio Club, Bev VK6DE, Geraldton Radio Group segment of VK6 WIA News.

These are only a few of the many who have helped over the past year to put ALARA "on the map".

On the artistic side, we were delighted with the donation of a beautifully crocheted commemorative table-centre from Margaret VK4AOE, which was subsequently the first prize in the birthday mini-contest. Marlene VK5QO, gave us the "jazzy" cover on our birthday edition of the newsletter, and Valda, the artwork on our stickers, and especially the lovely Award Birthday Stickers. I was lucky enough to receive one of these, a much admired addition to my Award.

Marlene VK5QO, wrote the most interesting and informative 75th Anniversary Special for AR on the WIA beginnings in South Australia.

A very important achievement for ALARA was being the first organisation to affiliate Federally with the WIA.

On a sad note, Margaret VK2AHD, Val VK4FKL, and Verle VK2MR became silent keys, and are greatly missed by us all.

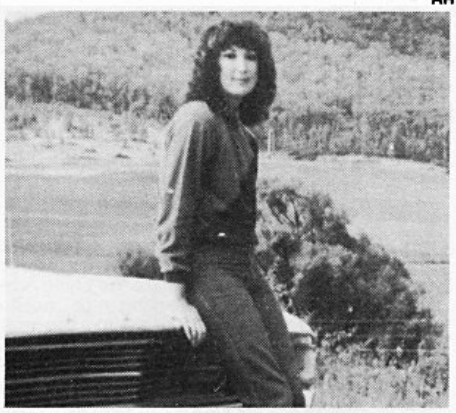
There were a few changes in the Committee, and hopefully the "cogs that keep the machinery running" will function as smoothly as they have in the past.

Right Girls! Let us see what we can do with 1986.

Don't forget the official Monday night nets during Daylight Saving Time begin at 1000UTC.

In conclusion, a very happy New Year to all.

33/73, Joy VK2EBX
AR



Jan VK3NCA.

THE GREAT 75TH WIA ANNIVERSARY 1910 — 1985

A Volunteer Bus Driver's View.

Geoff Tresise VK3CNX
20 Lorimer Street, South Melbourne, Vic. 3205

The Wireless Institute of Australia was 75 years old in 1985, and the Federal Executive decided to make the birthday a real landmark in its, already, colourful history. It was decided that this memorable occasion should not only include members living in Australia and abroad, but to extend invitations to many and varied interested communicators all over the world.

Now, how on earth could such a large and gala affair as the WIA's 75th Anniversary Dinner affect me? About three weeks prior to the event, I heard a plea for volunteers from the amateur fraternity, on the VK3 WIA Broadcast, for people to drive buses, which would be used to shuttle the overseas guests to and from the airport, and other sightseeing tours that had been arranged by Executive. The guests drew lots each day to decide which trip would suit their needs for the day.

It appeared that the most popular trips were visits to the Melbourne Zoo, the Arts and Entertainment Centre, the Fitzroy and Botanical Gardens, and just touring around the City on sightseeing tours.

There were several side-trips, and barbeques at the homes of various amateurs. I was fortunate to take a large contingent of Japanese visitors to the home of Bruce and Gwen Bathols, VK3UV, where every one had a delightful evening, thanks to the hosts.

There was another bus which ventured to Philip Island to witness the beaching of the fairy penguins, in the evening and to see some koalas in their natural habitat.

And enjoy themselves the guest certainly did, as their repeated requests for varied trips showed. The various trips and outings were offered by the hosts so that not one minute of their time would be idle and lacking in interest.

The weather for the entire occasion remained fairly stable — hot to warm and humid — but on my first day in the bus at Tullamarine Airport, to meet some overseas guests, the sky appeared to open up with flashes of lightning, thunder and a three- quarter of an hour hail-storm, with hail-stones as large as golf balls.

In all, the whole event evolved with nary a hitch, although some last-minute changes in some trips were made. During the whole exercise, the bus drivers and co-ordinators (at the Southern Cross Hotel) kept in touch using hand-held equipment, employing FM channel 6500 simplex, and channel 6850, Mount Macedon Repeater.

Every whim of the guests was catered for, and it will remain in their minds for a long time to come.

Thanks must go to all concerned with the planning and organisation of the whole event, with special thanks to Earl Russell VK3BER, Peter Wolfenden VK3KAU, Alan Noble VK3BBM, Bruce Bathols VK3UV, all drivers of the buses, and people who loaned equipment for the duration of the exercise.

Special thanks to the Federal Executive of the WIA for arranging such a magnificent event, and we can certainly look forward to the first Amateur Radio Society Centenary, in 2010.

AR

Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
56 Baden Powell Drive, Frankston, Vic. 3199

SAMPLE EXAMINATION PAPER FOR AOCP THEORY

This month, an examination paper for AOCP Theory is presented for all to test their knowledge. Select the correct or most appropriate alternative. Answers appear at the end of this paper.

1 The third harmonic of a transmission at 7.1MHz is:

a 2.36MHz.
b 10.1MHz.
c 21.3MHz.
d 28.43MHz.

2 For a given inductance, as the applied frequency is increased the reactance will:

a increase.
b decrease.
c be unchanged.
d approach the resistance value.

3 The velocity factor of a radio wave is:

a the speed at which it travels in a dielectric.
b the speed of light.
c 0.66.
d the ratio of its speed in a medium to its speed in free space.

4 To use a FET voltmeter to measure AC voltages it is necessary to:

a provide switching for different current ranges.
b provide switching for different frequency ranges.
c increase the resistance of the input probe.
d provide a probe containing a rectifier.

5 The PIV rating of a silicon diode in a half-wave rectifier should be:

a twice the expected RMS voltage of the secondary.
b at least equal to the peak-to-peak voltage of the secondary.
c equal to the peak voltage of the secondary.
d about half the peak voltage of the primary.

6 A well regulated power supply is one in which:

a the internal temperature remains constant.
b all filter capacitors are by-passed by bleeder resistors.
c there is very little voltage ripple in the output.
d no RF output is produced.

7 In any antenna there will be a current minimum at:

a the feedpoint.
b each quarter wave interval.
c ½ wave intervals.
d the ends of the antenna.

8 The Carrier Insertion Oscillator in an SSB receiver may have two crystals, which:

a allows large frequency adjustments to be made.
b provides selectable upper or lower sideband reception.
c improves the audio quality.
d may generate twice as many spurious signals.

9 A trapezoidal pattern is displayed on a cathode ray tube when:

a alternating voltage inputs are applied to both X and Y axes.
b two alternating voltages are applied to the X axis.
c an alternating voltage is applied to the Y axis and the X axis is earthed.
d an intermittent DC is applied to the X axis and the Y axis is earthed.

10 When two HF transmissions are made from the same location under identical conditions, the one with the lower angle of radiation will:

a have more extended skip zone.
b give rise to less tropospheric scatter.
c be more likely to be absorbed by the F layer.
d be less affected by sunspot variations.

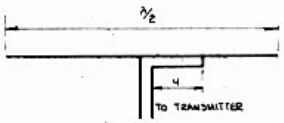
11 Antenna matching devices:

a provide a low SWR at the transmitter.
b prevent a flat line.
c ensure efficient power transfer to the antenna.
d prevent harmonic radiation.

12 Amateur transmissions on 1.8MHz may be detected by broadcast band receivers in close proximity due to:

a long antennas.
b a very long sky wave component.
c ionospheric propagation being more effective at night.
d the usually low IF of a broadcast band receiver.

13 This device:



a can be used to match antenna impedance to line impedance by varying dimension 'y'.
b is commonly known as a 'Delta match'.
c can be used only if balanced feedline is used.
d will reduce the radiation of harmonics so long as 'y' is more than a quarter wave length.

14 The transfer of intelligence from a strong unwanted signal to a weak wanted signal is known as:

a IF stage overload.
b cross-modulation.
c harmonic distortion.
d intermodulation distortion.

15 The power loss at UHF through a good quality PL259/SO239 plug and socket combination is significant because the:

a radius of the plug is a significant fraction of one wavelength.
b surface area of the inner conductor allows radiation from surface currents.
c the connectors are large and act as heat sinks.
d plug and socket surfaces are not very close contact.

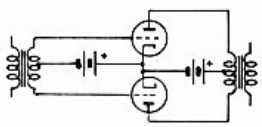
16 A receiver which has poor sensitivity on 21MHz may be adequate at 3.5MHz because:

a atmospheric noise can be the limiting factor at 3.5MHz.
b selectivity is better at 3.5MHz.
c of the effect of two RF stages.
d of the low second IF.

17 As a general rule, good HF transmitter design requires that:

a the VFO should be isolated.
b temperature compensation should be set immediately after switch on.
c pi-network tank circuits should be avoided to limit harmonic generation.
d PA input circuits be screened.

18 In this amplifier circuit the:



a vacuum tubes will be operating in Class A.
b two vacuum tubes are connected in push-pull.
c outputs of both tubes will be in phase.
d vacuum tubes are connected in parallel.

19 The harmful effects of an electric shock on the human body depend primarily on the:

a voltage applied.
b length of time of the contact.
c magnitude and path of the current.
d frequency of the applied voltage.

20 Of three television receivers being used in close proximity to an amateur station, only one suffers severe interference when the station transmits SSB signals. The cause is probably:

a a distorted field strength pattern.
b excessive harmonic radiation.
c a receiver fault.
d faulty transmitter antenna connections.

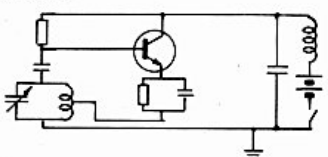
21 A direct conversion receiver:

a usually has a high IF.
b must have high audio gain.
c may suffer severe image interference.
d cannot be used for AM reception.

22 When a silicon junction is forward biased the:

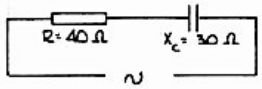
a N type material must be at least 0.2 volts positive.
b depletion layer is enhanced.
c junction temperature is reduced.
d junction capacitance is increased.

23 This circuit is:



a an Armstrong oscillator.
b a Hartley oscillator.
c an audio amplifier stage.
d a buffer amplifier stage.

24 The total impedance of this circuit is:



a 10 ohms.
b 8.5 ohms.
c 70 ohms.
d 50 ohms.

25 'Virtual Height' of an ionospheric layer is the height:

a at which the first refraction occurs.
b at which the most intense belt of ionisation occurs.
c at which a simple reflection would give the same propagation effects.
d which is necessary before multi-hop propagation can be effective.

26 An effective method of transmitting on the 70cm band could be to use a 144MHz transmitter and:

a a high pass filter.
b a high gain 70cm antenna.
c two doubler amplifiers.
d a varactor tripler.

27 Interference caused by power leaks from mains supply lines usually results from:

a line voltage variations.
b shiny insulators.
c loose wooden poles.
d comparatively low resistance paths to earth.

28 A 240 volt power transformer is designed to supply 24 amps at 20 volts from the secondary. Ignoring losses, the primary current will be:

a 2 amps.
b 5 amps.
c 10 amps.
d 24 amps.

29 'Damping' of a moving coil meter is usually achieved by:

a having the coils wound on an aluminium former.
b tightening the springs attached to the coil.
c increasing the intensity of the magnetic field.
d minimising needle bearing friction losses.

30 In a power supply using a transistorised DC-DC converter:

a there is no need for a transformer.
b the input DC is usually switched by one or two power transistors.
c a power transfer efficiency of 100 percent can be achieved.
d filtering is unnecessary.

31 A solid state device incorporating four layers of P and N material is called a:

a silicon controlled rectifier.
b PNPN transistor.
c full wave rectifier.
d voltage regulator.

32 The susceptibility to received RFI noise may be reduced by:

a using a vertical quarter wave-length antenna.
b using a vertical five-eighths wave-length antenna.
c a good earthing system.
d listening on the lowest frequency band.

33 A keying filter circuit is designed so that:

a it sharpens the rise and fall time of each pulse.
b it runs each pulse smoothly into the next.
c its effectiveness is determined by the time constant of its RC circuit.
d sparking at the key contacts is minimised.

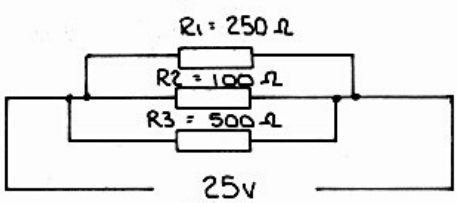
34 Communication via tropospheric propagation:

a can occur only when a temperature inversion occurs.
b requires horizontal polarisation of the antenna.
c is more likely to be effective over land than over water.
d is more likely to be effective at VHF and UHF than at HF.

35 A Class AB amplifier:

a can only be used at RF.
b will have higher efficiency and power output than Class A.
c has an operating angle for each tube of less than 180 degrees.
d will provide high distortion at AF.

36 The power dissipated in R1 will be:



a twice that dissipated in R3.
b two and one half times that dissipated in R2.
c about 0.6 watt.
d about 1.0 watt.

37 Discharge from a conductor which is within the field of a high voltage power line is:

a electromagnetic discharge.
b induced derived interference.
c electrostatic discharge.
d electric field interference.

38 A double conversion receiver tuned to the 10 metre band is found to also respond to a 52MHz amateur signal. This is probably due to:

a a local oscillator frequency of 40MHz.
b internal spurious signals in the receiver.
c third harmonic radiation.
d the low second IF

39 The fundamental carrier crystal for a 144MHz FM transmitter operates at 8MHz. To achieve 3kHz deviation at the transmitter output, the deviation of the fundamental oscillator must be:

a 18 times greater.
b about 166Hz.
c more than 3kHz.
d 18kHz.

40 Communication between two stations by means of amateur satellites is only possible:

a on bands above 420MHz.
b when both stations are directly under the satellites orbital path.
c when the satellite is in a geostationary orbit.
d if the satellite is above the horizon with reference to both stations.

41 A SSB communication system filter designed for use at 455kHz is likely to be:

a a two section LC filter.
b a four varactor device.
c a mechanical filter.
d in the first IF section of the receiver section.

42 A 'long wire' antenna is most effective when:

a centre fed with balanced twin lead.
b slightly less in length than a multiple of a half wavelength.
c operated only at odd harmonics of its resonant frequency.
d vertically polarised.

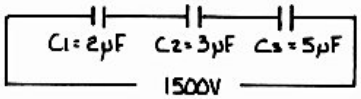
43 Excessive FM on the output of an SSB transmitter may be caused by:

a poor regulation of the power supply.
b poor selectivity of the final tank circuit.
c inadequate carrier suppression.
d a failure at the buffer amplifier stage.

44 The value of a resistor which is colour coded brown, black, gold, gold is:

a 1M ohm 5% tolerance.
b 100 ohm 5% tolerance.
c 2100 ohms 10% tolerance.
d 1 ohm 5% tolerance.

45 In this circuit, the voltage drop across:



a C3 is equal to that across C1+C2.
b each capacitor is the same.
c C3 is the greatest.
d C1 is the greatest.

46 A fuse in the output of a mains operated DC power supply should be:

a rated at twice the input peak current.
b connected in the earth lead of the largest electrolytic capacitor.
c rated at at least twice the expected peak current.
d rated at slightly more than the normal operating current.

47 A microphone which consists of a pair of charged plates but does not require a bias voltage is the:

a carbon.
b electret.
c ceramic.
d dynamic.

48 To increase the power output of a transmitter by 6 decibels it would need to be:

a doubled.
b tripled.
c quadrupled.
d multiplied by ten.

49 A bipolar transistor operating in a circuit with a voltage gain of less than 1:

a is in a common emitter configuration.
b has a high harmonic output.
c is likely to be an emitter follower.
d must be an NPN transistor.

50 An advantage of using a FET as a buffer amplifier is that it:

a provides a low impedance.
b provides a variable impedance load.
c minimises loading on the output of the previous circuit.
d provides maximum harmonic generation.

ANSWERS TO QUESTIONS — AOCP THEORY

1 c	11 c	21 b	31 a	41 c
2 a	12 d	22 d	32 c	42 b
3 d	13 a	23 b	33 c	43 a
4 d	14 b	24 d	34 d	44 d
5 b	15 a	25 c	35 b	45 d
6 c	16 a	26 d	36 a	46 d
7 d	17 a	27 d	37 c	47 b
8 b	18 b	28 a	38 a	48 c
9 a	19 c	29 a	39 b	49 c
10 a	20 c	30 b	40 d	50 c

RTTY PIONEER TELLS HOW IT ALL BEGAN

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

Eric Ferguson VK3KF, has been operating RTTY for some 30 years and remembers the early days, including a struggle to get the mode approved. The 78 year old said, his first involvement began in the early 1950s, while working with the Department of Civil Aviation.

In the Department's Research Laboratory he experimented with methods of getting efficient and reliable RTTY on HF networks covering Australia and its Territories.

Eric said it became a full time job developing systems such as "Twinplex" mode, which doubled the traffic handling capability of the conventional simplex mode. The first amateur RTTY was in 1957, after Forest Castle KR6AK, an American Servicemen in Okinawa asked Eric about RTTY.

"I could only reply that I knew of no such activity, but added I was technically involved, as part of my work.

"It was arranged for me to listen for Forest on equipment at work on a 21MHz frequency," he said.

The first attempt failed because Eric's equipment was set at 50 BAUD. The speed was changed to 45.45 BAUD and a short time later a good print-out was achieved.

Eric was satisfied at leaving his amateur RTTY operation right there, but Forest pushed for a two-way RTTY contact. Eric then used a borrowed Test and Distortion Measuring set and sent 'The Quick Brown Fox' test to KR6AK. Forest only renewed his arm twisting with increased vigor for a two-way QSO.

"The thinking cap was donned and it came to mind that a crystal controlled FSK oscillator I had developed mainly for the Twinplex mode could easily be adapted to excite the VK3KF transmitter.

'Almost overnight, a simplified version was knocked up and by sorting through a box of crystals, one was found with a fourth harmonic giving 21.090MHz," Eric said.

With a teleprinter carried home from work on a weekend, successful two-way contact was made between VK3KF and KR6AK.

"I cannot recall the exact date, but it would have been about the end of June 1957," he said.

The exercise was repeated the next weekend, but Eric then explained to Forest that F1 emission was not authorised in Australia. The story may have ended there but for Eric printing out several US RTTY stations a few hours later.

"I felt quite frustrated at not being legally able to go back to them. My work programme also intervened sending me to other parts of Australia and Papua-New Guinea," Eric said.

Due to correspondence with some of the Americans, whose RTTY signals Eric had reported on, a Southern California group shipped a Model 15 teletype, which caused a stir in the Australian Customs Department. After some haggling, a compromise was reached and Eric paid duty on the teletype's motors and spares.

Upon approaching the PMG for permission to use RTTY, F1 emission, a three month trial, on a fixed 21MHz frequency, was granted. But the PMG was reluctant to allow Eric another RTTY permit due to objections from within the amateur ranks.

Eric said the objections were due to the belief that F1 required an excessive band width. Eric, using a newly acquired HP spectrograph analyser, demonstrated to the PMG that the F1 sidebands were considerably narrower than AM.

RTTY was slow to catch on because of equipment shortages. Eventually permits were granted to Bill Storer VK2EG, Chas Noble VK4RQ and ZL3HJ and ZL1WB, in New Zealand.

Oceania was waking up to RTTY and the Americans were scrambling to make contact.

In the early 1960s, the Southern Pacific Radio Teleprinter Society, affiliated to NZART, was formed, with ZL1WB as President and ZK1BS and VK3KF as Vice-Presidents.

In the early and mid 1970s, when permission for RTTY was given by many countries, teleprinters were at a premium, said Eric.

The relatively recent availability of Siemens Model 100 teleprinters had given RTTY in Australia a boost in the arm and resulted in a 'pensioning off' of Model 15 and Creed printers.

Looking to the future, Eric considers RTTY as it was known today would be phased out, probably be the late 1980s, in favour of digital procedures, but he doesn't personally wish to join the computer age.

He also believes the advent of a family of satellites will eventually replace HF RTTY communication and open up a new field for experimentation.

Eric achieved WAC RTTY in 1962, his 100th country on RTTY in October 1971 (his total is now more than 131), and had won many certificates and trophies, in RTTY contests and activities.

This warm, friendly old-timer will see his days out enjoying the clattering of a teleprinter, which is *'music to the ears of the old die hard'* — to quote his own words.

AR

AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Winter: 3.685MHz — Summer: 7.064MHz
AMSAT PACIFIC
Control: JA1ANG
1100 UTC Sunday
14.305MHz
AMSAT SW PACIFIC
2200 UTC Saturday
21.280/28.878MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian elements from the AMSAT Australia Net. This information is also included in some WIA Divisional Broadcasts.

RAMBLINGS

With the larger than usual lead-time required for this issue, news items as such would be extremely outdated by the time you read this column. Consequently, I have included in this issue, details of the Japanese Amateur Satellite, JAS-1. This satellite is currently scheduled for launch in February 1986, however, there is some doubt that the launch may go ahead as scheduled.

The launch status will be updated on the AMSAT Australia Net, as news comes to hand.

AMSAT-UK MEMBERSHIP

As a reminder to all subscribers of AMSAT-UK, the yearly donation is now due. For 1986, this is 15 English pounds, and should be forwarded to Ron Broadbent, Honorary Secretary, AMSAT-UK, 94 Herongate Road, Wanstead Park, London, E12 5EQ.

Prospective members should first write to Ron, requesting an application form.

AMSAT-AUSTRALIA NEWSLETTER

The current subscribers to this informative Newsletter now exceed 140. Compiled by Graham VK5AGR, it contains the items of news that you always are in need of, but can never find in the more formal publications. To date there have been a number of small computer programmes written by various satellite communicators for those occasional calculations or routines that are buried deep in a text-book, and you wish to do on the spur of the moment and cannot remember what, where, and how. What's more, they all work, having been tried and tested by Graham, prior to inclusion in the Newsletter.

Each issue has the latest telemetry and message blocks from OSCAR 10, and Bulletin material from OSCARs 9 and 11.

The $15 subscription covers the cost of the Newsletter with the balance being a donation to the Amateur Satellite Programme.

The first donation being contemplated towards the programme will be for Phase-3D, currently under development by AMSAT-DL. This satellite is being 'dubbed' the "super-satellite" as initial plans call for a 250W output downlink transponder. The donation that will be forwarded by AMSAT-Australia will be specifically earmarked for an item of hardware. The more subscribers to the Newsletter will ensure a more sizable donation, for Phase-3D. New subscribers can forward their cheque made payable to the WIA (SA Division) Inc, and forward to Graham VK5AGR, QTHR.

JAS-1 JAPAN'S FIRST AMATEUR SATELLITE is scheduled for February 1986!

Translated and Edited by K Wilkinson ZL2BJR, from JARL News and other JARL material. © August 1985. Preliminary copy, subject to change.

BRIEF HISTORY

Launched in 1957, the Russian Sputnik 1 was the first satellite. Sputnik transmitted in the 20MHz band, not far from the 21MHz amateur band, so was heard by many radio amateurs.

The American OSCAR 1, launched in December 1961, was the first radio amateur satellite. It transmitted a beacon and the Morse signal 'HI' in the two metre band, and had a life of about three weeks. OSCAR 3, in 1965, was the first amateur satellite to carry a transponder, making communication via satellite possible,

Though individual Japanese had contributed financially to the OSCAR series, OSCAR 8 was the first satellite to which Japan made a technical contribution — the JAMSAT group, with JARL support, built the 'J' mode transponder and switching regulator. The transponder was a success, and lasted some five years — longer than the design life.

Discussion about a Japanese amateur satellite started in 1980, and the feasibility of using a Japanese H-I rocket to launch such a satellite was considered in 1981. The chairman of the group was then Morimotosan JA1NET, and JA1CO was appointed technical project manager in 1982.

A schedule was produced, and it was decided — because of power supply limitations — to use only J-mode (2m uplink, 435MHz downlink), with both analog and digital transponders.

JA1JHF was selected to manage the transponder project team (which consisted mainly of people who had helped with the OSCAR 8 project), and JA1ANG — the current JAMSAT president, and a member of the AMSAT committee — was asked to help with the digital transponder.

JAS-1 — as the satellite had come to be called — was given the go-ahead in March 1983, and it was proposed to launch it in February 1986 by two-stage H-I rocket (produced by Mitsubishi Heavy Industries). (An H-I is on display in the Japanese government theme pavilion at Expo).

It was decided that the body of the satellite would be built by NEC at their plant in Yokohama, and — to avoid any last-minute problems— two satellites would be built. NEC decided to use a 26-sided polyhedran rather than an octahedran for the satellite body — an aluminium honeycomb sandwich. NASDA (the Japanese National Space Agency) used a model of JAS-1 to test the antenna patterns.

JA1NET was hospitalised, and JA1AD was appointed to act for him.

In 1984, detailed work schedules were produced. Transponders were constructed at JARL during team members' summer vacation, and NEC installed them in the first flight model of the satellite.

In December, JA1NET became a silent key.

Testing of the first satellite was completed in April 1985, and construction of the second was started. Team members finished the second set of transponders in a marathon session during the "golden week" holidays in May.

Transponders

Both analog and digital, J mode (2m uplink, 435MHz downlink). LSB is normally used for the analog uplink, but FM is required for the digital uplink. The downlink is normally USB. Depending on battery condition and schedule (available via JARL telephone service), either analog or digital transponder will be operating. There may be special times scheduled for SSTV, FAX, and RTTY only. Both transponders are only likely to be operated together on weekends.

Analog operation will be limited to "line-of-sight", real-time QSOs, but digital mode will permit bulletin board (store-and- forward) operation. Uplink EIRP required: about 100W. Uplink antenna gain of 10dBi, transmitter power of 10W should be satisfactory. Don't use a higher uplink gain-power product! Downlink (receive) antenna gain of 15dBi should be satisfactory. With such antenna gain figures, the antenna does not need a rotator for the vertical plane — it can be fixed to point 20 degrees above the horizontal.

Analog (JA-mode) Transponder

Uplink 145.900-146.000MHz (LSB or CW). Downlink 435.900-435.800MHz (frequency-inverted to reduce Doppler effect, USB or CW). Don't use FM or AM, or tune up in the satellite passband! First IF is 29.500-29.600MHz. Second IF with 100kHz bandpass crystal filter is on 10.630MHz. On 435.795MHz there will be a CW/PSK beacon (transponder output of 100mW) alternating between a 15- second CW sequence — 'HI' plus a series of three-digit numbers representing telemetry data such as solar cell status, at about 20WPM — and 15 seconds of PSK output at 1200 Baud.

Format of CW Telemetry Data

HI HI 1A 1B 1D
2A 2B 2C 2D
3A 3B 3C 3D
4A 4B 4C 4D
5A 5B 5C 5D

(Note: 1-3 are analog data, 4-5 are status data)

A, B, C, and D are two-digit numbers. Some that may be of interest (divide the two-digit number by 50 to get N):

1A: Solar cell output N (0 to 2A)
1B: Charge rate 2*(N-1)(0 to 2A)
1C: Nicad voltage 11*N (to 20V)
2C: JA Tx O/P 1.1*N.618mW (3W)

Analog Mode Operation

First perform a loop-back test — find a free downlink frequency, and compute the corresponding uplink frequency (581.800-downlink)MHz. Suppose that 435.870MHz is free, then the corresponding uplink frequency is 145.930MHz. (Use headphones with the receiver, to avoid transmitting receiver noise, and to avoid audio feedback). Transmit your call sign, and adjust the transmitter VFO to tune in the received signal (there will be a frequency shift of 2-3kHz due to Doppler effect).

Digital (JD-mode) Transponder

Four uplinks, 145.850/870/890/910MHz (use FM transmitter), AX.25 lev.-2 protocol 1200-bd. NRZI signal transmitted as a Manchester-coded (biphase) signal; downlink is a PSK-coded NRZI 1200-bd. signal on 435.910MHz (use an SSB receiver). A suitable modem circuit is shown in a Japanese-language book on JAS-1. The modulator divides down the (32f) clock of the HDLC controller and gates it with the HDLC NRZI output to create the Manchester-coded signal. The demodulator (developed by JA1TUR for receiving OSCAR-10 telemetry) uses a 565 PLL, D flip-flop and XOR gate. (The Bell 202 FSK modems provided in most TNCs are not suitable). The satellite receiver is a single-conversion superhet with 10.630MHz IF; transmitter output will be about 1W. JD-mode telemetry: 1200 Baud PSK (multiplexed packet output on 435.910MHz).

Digital Transponder Hardware

The CPU module uses a CMOS NSC-800 (Z80 compatible) and 1 M-byte of 256 k-DRAM memory — ten 15cm x 15cm double-sided PC boards, and 327 ICs.

The HDLC module (four receive, one transmit channel) uses another 144 ICs. These modules consume three watts. Tantalum film covers top and bottom surfaces of the ICs, to protect them from radiation. The programme is uploaded from an earth station.

JAS-1 Antennas

There will be three groups of antennas. The 144MHz receive antenna will be a ¼-wave monopole (whip); both the 430MHz digital transmit antenna on the same face and the 430MHz analog antenna on the opposite face use four (¼-wave) antennas in a turnstile configuration, a Wilkinson hybrid (transformer) configuration is used to feed them 90 degrees out of phase — provide a circularly polarised wave — and minimise the effect on the other antennas if any one of the four antennas is damaged.

The solar cells on the satellite surface also act as a ground plane.

OSCAR-10 APOGEES
JANUARY 1986

DAY #	ORBIT #	APOGEE U.T.C HHMM:SS	SATELLITE CO-ORDINATES LAT DEG	LON DEG	BEAM HEADINGS SYDNEY AZ DEG	SYDNEY EL DEG	ADELAIDE AZ DEG	ADELAIDE EL DEG	PERTH AZ DEG	PERTH EL DEG
1st January										
1	1921	1112:14	-25	274	260	25	267	37	277	58
2nd January										
2	1923	1031:16	-25	265	264	34	272	45	285	67
3rd January										
3	1925	0950:19	-25	255	269	42	278	54	301	76
4th January										
4	1927	0909:22	-25	246	275	51	287	63	346	82
5th January										
5	1929	0828:24	-25	237	282	60	301	71	47	79
6th January										
6	1931	0747:27	-25	227	293	69	330	78	71	71
7th January										
7	1933	0706:32	-25	218	315	76	20	78	81	62
8th January										
8	1935	0625:35	-25	208	3	80	54	73	88	53
9th January										
9	1937	0544:37	-26	199	48	76	71	65	93	44
10th January										
10	1939	0503:40	-26	190	69	68	80	56	97	35
11th January										
11	1941	0422:42	-26	180	79	59	87	47	101	26
12th January										
12	1943	0341:48	-26	171	86	51	92	39	105	18
13th January										
13	1945	0300:50	-26	161	92	42	97	30	109	10
13	1946	1440:21	-26	337					247	3
14th January										
14	1947	0219:53	-26	152	96	33	102	22	113	3
14	1948	1359:24	-26	327					251	10
15th January										
15	1949	0138:55	-26	142	101	25	106	14		
15	1950	1318:27	-26	318			245	1	255	18
16th January										
16	1951	0057:58	-26	133	105	17	111	7		
16	1952	1237:29	-26	308	243	-2	250	8	259	26
17th January										
17	1953	0017:03	-26	124	110	9	116	-0		
17	1954	1156:34	-26	299	248	5	254	16	263	35
17	1955	2336:06	-26	114	114	2				
18th January										
18	1956	1115:37	-26	290	252	13	259	24	267	44
19th January										
19	1958	1034:39	-26	280	257	21	263	32	272	53
20th January										
20	1960	0953:42	-26	271	261	29	268	40	278	62
21st January										
21	1962	0912:45	-26	261	265	37	273	49	288	71
22nd January										
22	1964	0831:50	-26	252	270	46	280	58	310	79
23rd January										
23	1966	0750:52	-26	242	276	55	290	66	14	83
24th January										
24	1968	0709:55	-26	233	284	64	300	74	61	76
25th January										
25	1970	0628:58	-26	224	298	72	347	79	77	68
26th January										
26	1972	0548:00	-26	214	328	79	37	77	85	59
27th January										
27	1974	0507:05	-26	205	25	80	63	70	90	50
28th January										
28	1976	0426:08	-26	195	59	73	76	62	95	41
29th January										
29	1978	0345:11	-26	186	74	65	84	53	99	32
30th January										
30	1980	0304:13	-26	177	83	56	90	44	103	23
31st January										
31	1982	0223:16	-26	167	89	47	95	36	107	15
31	1983	1402:47	-26	342					244	-2

Solar Cells
Power output approximately 8.5W. Storage batteries: 11 Nicad cells in series, initial capacity 6Ah

Further Statistics
Satellite: 470mm high, weight 50kg. H-I two-stage rocket: 40m long, 2.4m in diameter; weight 139.1t; capable of carrying a 550kg payload.

Orbit: elliptical, 1500km high; period approximately 1 hour 56 minutes; "window" (over Japan) approximately 20 minutes; 6 passes per day.

A chart will be available to make it easy to calculate the flight path.

de Colin
AR

BILL THE MECHANIC

Ted Holmes VK3DEH
20 Edmunds Street, Parkdale, Vic. 3195

If there was one thing Bill Blitheringtwit knew he was good at, that was anything mechanical. He had to admit that stupid things like transistors made about as much sense to him as Sanscrit. As for chips, he had nothing but contempt for them. Idiotic things! How was a chap expected to do anything with them? You only had to look at them and the blessed things gave up. Then you could never find out what was wrong with them.

The trouble was that there was nothing you could see. It was all locked away in that silly little plastic rectangle with the pathetic thin legs which broke at the slightest touch. No, transistors, chips and their ilk were definitely not for him. But things mechanical — that was different. You could see what you were working on and, better still, if all else failed, you could always give it a good swipe with a hammer or even kick it. It was surprising how many things responded to a swift boot in the ribs.

Take the Holden. He'd fixed that quite well, when the brakes had packed up and the rear wheel fell off. He'd almost won his argument at the local garage but the boss had intervened and been most objectionable. Bill had afterwards decided to have the roadworthy test done somewhere else.

All this he concluded to himself, as he knelt on the floor and peered into the bowels of his Model 100, into which he had recently dropped a screwdriver. Strange thing was he couldn't see the screwdriver anywhere. It was as though the machine had eaten it. It was a bit heavy to pick up and turn upside down, but he might as well try it.

Puffing a little, he hauled the unit up from the floor and inverted it. As though by signal the carriage immediately came of and fell on his foot. Bill yelped with pain and jumped. He found himself hopping around in his shack on one foot and still hanging on to what was left of the Model 100. Still no screwdriver appeared. Better take the cover off and have a look.

He set the machine down and rummaged around for another screwdriver. To his amazement he managed to drop this into the machine, where it presumably joined its companion. Bill couldn't believe it. If things went on like this, pretty soon he would run out of screwdrivers! Again he searched around and came up with an old Army type and he attacked the case with this. Finally he got it off and revealed the innards of the machine, which looked at this stage somewhat forlorn.

By now Bill was a bit sick of RTTY and all it stood for. So he pushed the machine under a desk to gather dust. The two screwdrivers lay on the carpet, hidden by assorted rubbish, where they remained undetected for a considerable time.

AR

QSP

AMATEUR HEROICS

Alan Gershbien W4LTA, narrowly escaped death recently, with the help of amateur radio. Whilst walking along a Bahamas beach, Alan stepped on what he thought was a shell, but it was in fact a deadly stonefish. Within a short time, Alan's foot and ankle had swollen to nearly twice normal size, and excruciating pain began shooting up his leg, and he began to have trouble breathing.

Alan instructed his XYL, Nancy, to call for emergency medical assistance on the 14.313MHz Maritime Mobile Net on his new TS430S. Although Nancy is not an amateur, she knew that the frequency was programmed into one of the memory channels, and succeeded in calling up the frequency on the VFO.

Nancy contacted the Net Control Operator, Randy Maurer WA3HLP, and was able to get the necessary information from the Tampa Poison Control Centre for almost immediate relief to Alan's discomfort.

From 73 for Radio Amateurs — August 1985

Contests

Ian Hunt VK5QX
FEDERAL CONTEST MANAGER
Box 1234, GPO, Adelaide, SA. 5001

CONTEST CALENDAR

JANUARY

1	*UBA SWL Competition 1986 (Rules October AR)*
6	*Ross Hull Memorial VHF Contest concludes*
11	*40 metre World SSB Championship Contest**
11-12	*Michigan QRP Club CW Contest*
12	*75 metre World SSB Championship Contest**
18-19	*Hungarian DX Contest (Rules this issue)*
18-19	*White Rose SWL Contest (Rules December AR)*
18-19	*160 metre World SSB Championship Contest**
24-26	*CQ WW 160 metre CW Contest*
25	*15 metre World SSB Championship Contest**
26	*20 metre World SSB Championship Contest**

FEBRUARY

1- 2	*RSGB 7MHz SSB Contest (Rules this issue)*
15-16	*1986 ARRL International DX Contest — CW Weekend (Rules this issue)*
22-23	*RSGB 7MHz CW Contest*
21-23	*CQ WW 160 metre SSB Contest (Rules this issue)*

MARCH

1- 2	*1986 ARRL International DX Contest — SSB Weekend (Rules this issue)*
8- 9	*Commonwealth Contest 1986 (Rules this issue)*
8- 9	*QCWA Phone QSO Party*
15-16	*John Moyle Memorial Field Day Contest*
15-16	*YL-ISSB CW QSO Party*
29-30	*CQ WW WPX SSB Contest*

** Denotes World SSB Championship Contests sponsored by 73 magazine. Rules for these contests appeared in December AR.*

Members may note that the CW Contest no longer appears in the Contest Calendar. I have been advised by the Federal Office that the matter of this contest has been discussed and it has been agreed that it should not continue. However, it has also been decided that, to encourage our members to utilise the CW mode, the President's Cup will be awarded on the basis of the top scorer, on CW, in the John Moyle Memorial Field Day Contest. Full details regarding this new approach, which was suggested as a compromise by Wally Watkins VK2DEW, Alternate Federal Councillor for the New South Wales Division, will be provided in the rules for that contest, which will appear in February magazine.

I would like to begin this New Year by wishing you, one and all, a very happy New Year, and also that it will be one of great success for you in all of your activities. I also trust that it will be a year of co-operation and achievement within our ranks, throughout the world.

BUSY — BUSY

I would like to point out that these notes are being compiled in the wee small hours, early in November, so they may make the deadline for January. Unfortunately, I will not be able to provide the results of the 1985 Remembrance Day Contest in this issue, as I had hoped, due mainly to the fact that I have received only about 19 hours notice of having to leave for a visit to the USA, and consequently, as the duration of the trip will exceed two weeks, this does not provide me with enough time to finalise the results. I am hopeful of providing the results for both the RD and the VK Novice Contests in February magazine.

BACKLOG OF CERTIFICATES

I am pleased to be able to report that the backlog of Contest Certificates, up to the end of 1984, have been completed, and are about to be forwarded to the Federal Office for distribution. Hopefully, by the time you read this column, you will have received your wayward certificate.

It now only remains to have the certificates made out for the 1986 Field Day Contest, which will bring matters right up-to- date. I will then be making immediate arrangements for the Remembrance Day and VK Novice Contest certificates for 1985, to be completed after my return from overseas. I am most grateful to the Federal Secretary/Manager, Mr Reg Macey, for his kind offer to relieve me from the large workload of addressing, and mailing the extremely large number of certificates involved.

CONTEST RULES

Included in the contest rules published in this issue are a set of rules to be used as **'guidelines only'** for the 1986 ARRL International DX Contest. I have not received any copy of such rules from the ARRL, however, I am aware that the rules for this contest generally vary little from year to year. I have thus taken a copy of the rules as published for 1985 and modified them in the light of what you could expect. Hence, my warning, ***they are for guidance only.***

The results for the 1985 Hungarian DX Contest have only recently been received. These results indicate very little interest by VK amateurs in this contest. I will provide the rules for this contest, albeit rather belatedly, so as to allow you a chance to try it this year. If there appears to be sufficient interest aroused, I would intend to include it in future years, otherwise I may as well ignore it altogether.

As I have previously pointed out there are certainly too many contests, by far, although just what can be done about it at this stage, I am not sure. Maybe, as out national organisation is the oldest of it kind in the world, it could put its years of experience to use and become a leading body through the IARU in the cause to have some rational modifications made to the international scene. *Will you perhaps encourage your Division to vote for such a proposal at the next Convention?*

1986 ARRL INTERNATIONAL DX CONTEST

To the serious DX contestant and the casual county hunter alike, the third full weekend in February (15-16 for CW) and the first full weekend in March (1-2 for phone) bring the challenge and excitement of the ARRL International DX Contest. For these two weekends each year, the bands spring to life with DX aplenty. An operator can choose to go all out in the competition for a top score, or leisurely chase those last few countries needed to finish the requirements for the five-band DXCC award.

If you participated in the 1985 ARRL International DX Contest, you are that much ahead of the rest.

Use of the official entry forms makes the post-contest paper-work easier for you, and makes the job of compiling the results a breeze. To receive a set of entry forms, send a SAE (business sized) and two IRCs to ARRL Headquarters.

Complete contest rules are listed below. Any questions resulting from these rules should be directed to ARRL Headquarters.

RULES

Amateurs world-wide are eligible.

Amateurs to work as many W/VE stations in as many states and provinces, as possible.

CW — to be held on 15-16th February

PHONE — to be held on 1st-2nd March

The contest is for 48 hours duration each mode (separate contests). Starts 0000 UTC Saturday; ends 2400 UTC Sunday.

Categories:

Single Operator — One person performs all operating and logging functions. Use of spotting nets (operator arrangements involving assistance through DX-alerting nets, etc) is not permitted. Single-operator stations are allowed only one transmitted signal at any given time.

1 All band.

2 Single band (one only). Single-band entrants who make contacts on other bands should submit logs for checking purposes.

Multi-operator — More than one person operates, checks for duplicates, keeps the log, etc.

1 Single transmitter. One transmitted signal at any given time. Once the station has begun operation on a given band, it must remain on that band for at least 10 minutes; listening time counts as operating time. Multi-operator, single-transmitter stations must keep a single, chronological log for the entire contest period. Violation of the 10-minute rule or improper logging will result in an entrant's reclassification to the unlimited multi-multi class.

2 Two transmitters. A maximum of two transmitted signals at any given time, on different bands. Once either station has begun operation on a given band, it must remain on that band for at least 10 minutes; listening time counts as operating time. Both transmitters may work any and all stations; the second transmitter is **not** *limited to working new multipliers only. Each of the two transmitters must keep a separate chronological log for the entire contest period. Violation of the 10-minute rule by either or both transmitters or improper logging will result in an entrant's reclassification to the unlimited multi-multi class.*

3 Unlimited. A maximum of one transmitted signal per band at any given time. Unlimited multi-multi stations must keep a separate, chronological log for each band for the entire contest period.

QRP — Single operator, all band only. QRP is defined as 10W input or less (or five watts output or less).

Contest Exchange: Stations send a signal report and power (three-digit number indicating approximate transmitter input power).

Scoring: Count three points per W/VE QSO. Multipliers are the sum of US states (except KH6/KL7) and District of Columbia (DC), VE1-7, VO, VE8/VY1, worked per band. Maximum of 58 per band. The final score is QSO points X multiplier = final score.

Miscellaneous — Call signs and exchange information must be received and logged by each station for a complete QSO.

All operators must observe the limitations of their operators license at all times.

Your call sign must indicate your DXCC country station location (KH6XYZ/W1 in Maine; FG0AAA/FS on St Martin, etc).

One operator may not use more than one call sign from any given location during the contest period.

The same station may be worked only once per band — no cross mode, cross band, or repeater contacts.

Aeronautical and maritime mobile stations outside the US and Canada may **not** be worked for QSO or multiplier credits by W/VE stations.

All transmitters and receivers must be located within a 500 metre diameter circle, excluding directly connected antennas. This prohibits the use of remote receiving installations. Exception: Multi-operator stations may use spotting nets for multiplier hunting only.

Reporting — Logs must indicate times in UTC, bands, calls, and complete exchanges. Multipliers should be clearly marked in the log the first time worked. Entries with more than 500 QSOs total must include cross-check sheets (dupe sheets).

All operators of multi-operator stations must be listed.

Entries must be post-marked within 30 days of the last contest weekend (1st April 1986). Logs not postmarked by the deadline will be classified as check logs; no extensions, no exceptions. All stations are requested to send their entries in as early as possible. Entries received after mid-July will not make QST listings.

Plaques will be awarded in both the CW and Phone contests to the top scorer in the single operator-all band category world- wide and on each continent. In addition, world-wide leaders in

the single operator-single band, QRP, multi-operator-single transmitter, multi-operator-two transmitters and multi-operator unlimited categories will receive plaques.

Additional plaques will be awarded as sponsored.

Certificates will be awarded on a similar basis.

Conditions of Entry — General contest 'fair play' and disqualification criteria apply. If a contestant is disqualified, that operator will be barred from entering the contest on that mode the following year, and the calls of all disqualified entrants will be listed in QST with the contest results.

RSGB 7MHz SSB & CW CONTESTS 1986

All licenced amateurs are eligible to enter this contest.

TIMES — SSB: from 1200 UTC 1st February till 0900 UTC 2nd February 1986.

— CW: from 1200 UTC 22nd February till 0900 UTC 23rd February 1986.

BANDS — SSB: 7.040-7.100MHz; CW: 7.000-7.030MHz.

EXCHANGE — RS(T) plus serial number commencing at 001. When received, serial numbers from non-competing stations must be recorded.

SCORING — Non-European stations with British Isles stations 15 points per QSO. Note: *contacts* entrants are requested to confine their operation to within the lower 30kHz of each band except when contacting novice stations that operate above 21.100 and 28.100MHz. A contact exchange consists of RST and serial number commencing at 001. Serial numbers from non-competing stations, when sent, must be recorded.

Scoring Each completed contact will score five pints. In addition, a bonus of 20 points may be claimed for the first, second, and third contact with each Commonwealth call area. All British Isles prefixes (G, GB, GD, GI, GJ, GM, GU, and GW) count as one call area.

Logs A separate log for each band must be submitted and to include UTC, call sign of station worked, RS(T)/serial number sent, RS(T)/serial number received and points claimed. Band totals must be added together and submitted on a separate cover sheet. Duplicate contacts must be clearly marked without claim for points. Any unmarked duplicate contacts for which points have been claimed will be heavily penalised, and logs containing in excess of five will normally be disqualified.

Entries Entries may be single or multi-band. Single band entries may show, on separate sheets, contacts made on other bands for checking purposes only. Each entry should consist of the separate bands logs, together with a cover sheet declaration stating that the rules have

VK9Y	*Cocos Keeling Is*	ZL1	*
VK9Z	*Mellish Reef*	ZL2	*
VK0	*Heard Is*	ZL3	*
VK0	*Macquarie Is*	ZL4	*
VK0/VP8/		ZL7	*Chatham Is*
ZL5	*Antarctica*	ZL8	*Kermadec Is*
VO1	*Newfoundland*	ZL9	*Auckland & Campbell Is*
VO2	*Labrador*		
VP2E	*Anguilla*	3B6/3B7	*Agalega & St Brandon*
VP2K	*St Kitts, Nevis*	3B8	*Mauritius*
VP2M	*Montserrat*	3B9	*Rodriguez Is*
VP2V	*British Virgin Is*	3D2	*Fiji*
VP5	*Turks & Caicos Is*	3D6	*Swaziland*
VP8	*Falkland Is*	4S	*Sri Lanka*
VP8	*S Georgia*	5B4	*Cyprus*
VP8	*S Orkneys*	5H	*Tanzania*
VP8	*S Sandwich Is*	5N	*Nigeria*
VP8	*S Shetland Is*	5W	*West Samoa*
VP9	*Bermuda*	5X	*Uganda*
VQ9	*Chagos*	5Z	*Kenya*
VR6	*Pitcairn*	6Y	*Jamaica*
VS5	*Brunei*	7P	*Lesotho*
VS6	*Hong Kong*	7Q	*Malawi*
VY1	*Yukon*	8P	*Barbados*
VU	*India*	8Q	*Maldives*
VU	*Laccadive Is*	8R	*Guyana*
VU7	*Anadaman & Nicoba Is*	9G	*Ghana*
		9H	*Malta*
YJ	*Vanuatu*	9J	*Zambia*
Z2	*Zimbabwe*	9L	*Sierra Leone*
ZB2	*Gibraltar*	9M2	*W Malaysia*
ZC4	*Cyprus (UK Bases)*	9M6/8	*E Malaysia*
ZD7	*St Helena*	9V	*Singapore*
ZD8	*Ascension Is*	9Y	*Trinidad & Tobago*
ZD9	*Tristan da Cunha, Gough Is*		
ZF	*Cayman Is*		
ZK1	*Cook Is*		

* Due to recent changes in the New Zealand licen

Dunakanyar The applicant must confirm 5 HA/HG7 QSOs. Fee: 10 IRCs.

Balaton The applicant requires 15 points, and must work at least one club member. Club members count as five points and are HA3GJ, KGJ, KHL, GI, GQ, HE, HL, HQ, HZ, IG, IK, IQ, IS, NG, 4XW, 6NP, and 8UA.

The following stations count as three points: HA1KXX, XA, XX, ZY, 2RQ, KRQ, KSC, YRC, SH, Y, 3KHB, KHO, GG, GO, HK, HO, and HU.

The following stations count as one point: HA1KRA-KRZ, KXA-KXZ, KZA-KZZ, RA-RZ, XA-XZ, ZA-ZZ, DRA-DZZ. HA2KPA-KTZ, PA-TZ, ENA-EZZ. HA3KGA-KIZ, GA-IZ, FLA-FSZ. Fee: 10 IRCs

Budapest Award Requirements — 25 different HA/HG5 stations. Fee: 10 IRCs.

EDITOR'S NOTE — Recently, references have been made by another magazine about the lack of rules for the VK/ZL/Oceania Contest. All contesting members are aware that this contest is separate from the Federal Contest Manager's duties, and any queries about this contest should be directed to the VK/ZL/O Contest Manager, not the WIA Federal Contest Manager.

AR

QSP

WORLD'S LARGEST, FASTEST COMPUTER

The National Aeronautics and Space Administration (NASA) has unveiled what it says is the world's most powerful, and fastest, computer.

The unit is about half the size of a car, and capable of performing 250 million calculations per second.

The computer, which is being installed at the NASA Ames Research Centre, south of San Francisco, will be used primarily for aircraft and spacecraft design.

Built by Cray Research Inc, one of the worlds few companies making super-computers, the Cray-2 can handle 256 million word problems, 16 times more than those handled by previous super-computers.

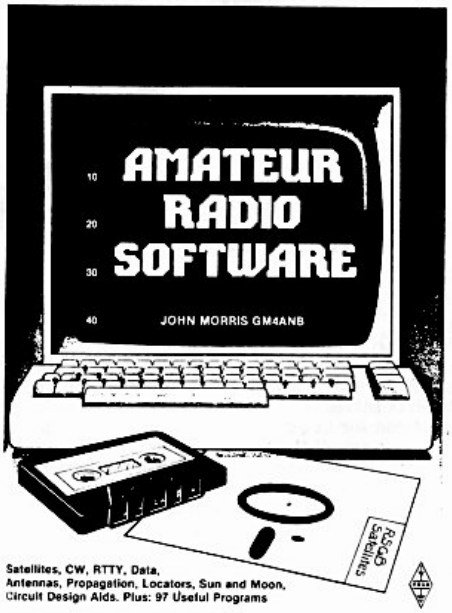
Scientists say the Cray-2 was the first element of a large computer system being assembled by NASA.

Once completed by late 1987, it is believed the computer will be able to perform one billion computations per second.

Book Review

AMATEUR RADIO SOFTWARE

Evan Jarman VK3ANI
TECHNICAL EDITOR



Satellites, CW, RTTY, Data, Antennas, Propagation, Locators, Sun and Moon, Circuit Design Aids. Plus: 97 Useful Programs

It seems that the home computer has achieved complete penetration of the amateur shacks. However, it suffers from one problem; without software (programs) it is useless. Having acquired a computer and grown tired of playing games and letter writing, what can you do? For radio amateurs, this book provides an answer.

AMATEUR RADIO SOFTWARE has two purposes. Firstly, it is a source book of programs. They are ready to roll, all they need in loading into the computer. Having tried a couple of the programs, I wanted them all 'on disk' just in case. The only limitation to this is that it will take a lot of typing. There are 97 programs, in all. Most are written in Basic language, which is almost the universal programming form for home computers, However, six of the programs are written in assembly language. These are the 'on air' or 'real time' programs.

Assembler is restricted to Morse code and radio teletype operation and caters for the 6502, Z80 and 6800 chips. The subtleties of various forms of Basic are discussed.

Secondly, AMATEUR RADIO SOFTWARE is a source-book of ideas. The various concepts in each field are discussed and protocols developed for handling them.

While limiting themselves to the programs listed, the author shows how the algorithm is developed. It is as a source of ideas that this book excels: for those who want to develop their own programs by seeing how others have tackled the problems one inevitably encounters.

Subjects discussed (and programs) are CW, RTTY (including AMTOR), Data, Antennas, Propagation, Great Circle Distances and Bearings, Satellites (including the sun and the moon), Circuit Design, and the Ubiquitous list (logs, etc).

It is the best book available at the moment, and sets a standard for others. The attention-to-detail is very good, but there is the occasional miss. The HF propagation program is not well described, and is a modified version of mini MUF, consequently it is not completely original. This is the only weakness found in a generally excellent publication.

If you are interested in software specifically for use in amateur radio, or are only seeking ideas on how to write your own, AMATEUR RADIO SOFTWARE, by John Morris GM4ANB and published by the RSGB 1985, is well worth acquiring. It will be available at your Divisional Bookshop during February.

AR

The world's coldest temperature was reportedly recorded on 14th January 1734, in Yeneseisk, Siberia. The temperature plummeted to 120 degrees Fahrenheit, below zero.
Courtesy Angela Laurence.

KENWOOD

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AR86

Awards

Joe Ackerman, VK4AIX
5 Koomooloo Court, Mermaid Waters, Qld 4218

The following notes are the last contribution from Joe VK4AIX, because, as of the first of this month, Ken Hall VK5AKH is the new Federal Awards Manager.

Thanks Joe, for your contributions for the past 12 months. — Ed

UNITED NATIONS AT FORTY AWARD

On 24th October 1985, the United Nations celebrated the 40th Anniversary of the coming into force of the United Nations Charter, signed at San Francisco in 1945.

To celebrate the event, and in the spirit of developing friendly relations among nations, the United Nations Staff Recreation Council Amateur Radio Club sponsored the UN AT 40 AWARD.

This award is available to any amateur radio station or SWL (on a heard basis), that contacted two of the three amateur stations operating with the United Nations prefix from 1st January to 31st December 1985. Contacts could have been made on any band or any mode.

The three stations are:

4U1UN at the UN Headquarters, New York.
4U1ITU at the International Telecommunication Headquarters, Geneva.
4U1VIC at the Vienna International Centre, Austria.

Applicants must send a list of the stations worked including — Date; Time; Mode; Report; and Band. This list must contain a signed statement declaring the bona fides of the application. The cost of the Award is US$5 or 15 IRCs, of which US$4 will be donated to UNICEF.

The application must be forwarded, before 1st February 1986, to: *United Nations Staff Recreation Council, Amateur Radio Club, United Nations Room DC1-0724, Box 20, New York, NY 10017.*

Award No 1 — W6AM; Award No 2 — W2JGR; Award No 3 — W6ISQ.

NEW DX-PEDITION AWARD

The Clipperton DX CLub has originated an interesting new award to encourage stations to work DXpeditions.

Valid contacts are from 1st January 1984.

An expedition is defined for the certificate as a station active less than three months (in other words temporary) from one location and who is a valid operation. The territory of the operation constitutes a distinct geographic location and doesn't need to be a distinct DXCC country.

Three classes of awards are available for total points.

Class 3 — 100 points
Class 2 — 250 (CDXC Excellence)
Class 1 — 500 (Honour Roll)

You receive one point on each band and mode. The same expedition worked on both modes gives one additional point. Also you must work expeditions on five continents minimum. Valid bands are 10; 15; 20; 40; 80; and 160 metres.

Detailed rules can be obtained by sending two IRCs to F6EYS, QTHR, with an SAE.

MAJOR MITCHELL AWARD

The Swan Hill District Radio Club is sponsoring an award to coincide with the 150th Anniversary of Swan Hill.

The Award will be known as THE MAJOR MITCHELL AWARD, and is available on a world-wide basis to all amateurs and SWLs.

Australian stations require three two-way contacts with members of the Swan Hill District Radio Club. One QSO is to be with the Club Station VK3BSH.

Overseas stations require two contacts with club members or one contact with the Club Station, VK3BSH.

All bands and modes, but no cross bands or modes will be permitted.

Contacts made through the Club Repeater, VK3RSH, will qualify.

Period of availability will be from 1st January to 31st December 1986.

No QSLs are required. Applications will be checked against members station logs.

Available to SWLs for accurate reports on transmissions heard. Reports from within VK and DX listeners follow the same rules as for transmitting stations.

Cost of the Award is $A2 within Australia, and $A3 or equivalent, for overseas.

Applicants to be sent to: *The Awards Manager, SHDRC, PO Box 682, Swan Hill, Vic. 3585.*

To assist amateurs and SWLs to obtain this award, a Club Net will commence on Tuesday, 4th February 1986, at 1000UTC on 3.565MHz ±. Bon chance!

DEUTSCHER AMATEUR RADIO CLUB AWARDS

These diplomas can be obtained by licensed radio amateurs and SWLs world-wide. All contacts must be made from the same country.

Awards for club stations will be issued to the club and not to an individual operator. The DARC DX AWARDS are based on the 'European Country List' and the 'ARRL DXCC List'. All amateur bands, for which the applicant holds a valid license may be used. A set application form for the awards is available for three IRCs at the address below. The use of the official forms is obligatory.

QSL cards for all contacts must be submitted with the application. Any altering or forging will result in disqualification. The service charge is 10 IRCs, 10.-DM or US$5 per award. The costs for each endorsement is 5 IRCs, 5.-DM or US$3.

All applications to: *DARC DX Awards, Walter Geyrhalter DL3RK, Box 1328, D-8950 Kaufbeuren, West Germany.*

New award holders will be published in cq-DL, the club magazine of DARC.

European Country List

C31; CT1; DL; EA; EA6; EI; F; FC; FC; G; GD; GI; GJ; GM Shetland; GU; GW; HA; HB; HB0; HV; I; IS; IT; JW Bear; JW Spitsbergen; JX; LA; LX; LZ; OE; OH; OH0; OJ0; OK; ON; OY; OZ; PA; SM; SP; SV; SV5 Rhodes; SV9 Crete; SV Athos; T77/M1; TA European part; TF; UA1346; UA2; UA Franz Josefs Land; UB; UC; UN/UK1N; UO; UP; UQ; UR; Y22-99/DM; YO; YU; ZA; ZB2; 1A0;3A; 4U1 Geneva; 4U1 Vienna; 9H1.

WAE (Worked all Europe)

A certificate awarded to amateur radio stations for contacts with European countries on different bands.

The WAE is issued in two divisions Telegraphy (2 x CW) and Telephony (2 x SSB/AM/FM). Each European country counts as one point on each band. For stations outside Europe contacts on 80 and 160m bands count as two points. Maximum five bands per country can be used.

WAE III at least 40 countries and 100 points
WAE II at least 50 countries and 150 points
WAE I at least 55 countries and 175 points

Holders of WAE I get a special WAE badge.

EU-DX-D (Europa-DX Diplom)

The EU-DX-D is an award that may be claimed annually. The EU-DX-D is issued in the following classes: Telegraphy - 2 x SSB - mixed modes. For the mixed class, at least 30 percent of the contacts must be made in a different mode.

A minimum of 50 points is required for the EU-DX-D per year. 20 points must be obtained by contacts with European countries and 30 points by contacts with countries outside Europe. All bands can be used. Each country counts as one point, on 80 and 160m they count as two points. Stickers are available for each additional block of four European and six non-European points within the same calendar year.

The EU-DX-D may be claimed every year anew. Each year's score may be added to obtain the EU-DX-D 500 badge and the EU-DX-D 1000 trophy. There is no limit to the number of years.

Europa Diplom

The Europa Diplom is awarded for working, or hearing amateurs in European countries. Applicants must prove a total score of at least 100 points.

ANNUAL SCORE: Each confirmed European country counts one point per year on each band.

TOTAL SCORE: Sum of the annual score for the year of application and the five preceding years. There is no more devaluation.

Europa Diplom Honour Roll

Each certificate holder with an actual score of at least 300 points will be listed in the Europa Diplom Honour Roll.

The Honour Roll will be published twice a year in cq-DL.

To improve the score, QSL cards may be submitted twice a year. Make sure that the award manager receives them before 30th June or 31st December of each year, to be considered in the subsequent publication.

Europa 300 Trophy

Owners of the Europa Diplom my obtain the Europa 300 Trophy. Applicants must prove to have 300 country points when counting each country, on each band only once in all the years. Serving charge is 20.-DM or US$10 for the trophy when applied for with the Europa Diplom.

100 LA

This award is issued by the Stavanger Group of the Norwegian Radio Relay League, who offer a cup in all three modes as a prize to the first applicants (licensed amateurs and SWLs on a heard basis) to obtain the requirements for the award.

Stations require 100 two-way radio contacts with different LA/LB stations, on or after 1st January 1984. LF, LJ, and LH stations do not count for this award.

All valid amateur bands can be used, however 10. 18, and 24MHz are not valid before 1st January 1989.

The award is issued for CW, phone, or mixed modes.

A list showing full details of the contacts, confirmed by QSL cards, should be certified by the Award Manager of the national society.

The fee for the award is 20 NOK or 10 IRCs.

The application must contain call sign; date; band; RST; and modes and be addressed to: *The Awards Manager, Stavangergruppen av NRRL, Postboks 354, 4001 Stavanger, Norway.*

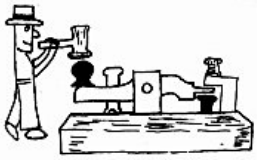
AR

JUBILEE 150 AWARD

VK5 amateurs will run nets on most frequencies to enable interstate amateurs to gain contacts for the J150 Award.

The main net will be on 3.586MHz on Sundays, Tuesdays, and Fridays, starting at 1000UTC. The first of these nets will commence on Sunday, 5th January, at 1000UTC.

John VK5SJ, is in charge of 'operations' and will provide further details and frequencies in next months issue of Amateur Radio. AR



Pounding Brass

Marshall Emm VK5FN
Box 389, Adelaide, SA. 5001

KEYS AND KEYERS (Part 1)

A request from a reader, coupled with an advertisement in a Japanese amateur publication, has prompted this reprise on the subject of keys and keyers. The advertisement featured a new key from Hy-mound, called 'the swallow'. I don't know how to describe it except to say that I have never seen a straight key with more adjustment knobs on it. I found that intriguing, because there are only so many things you **can** adjust on a straight key. I will try to find out more about it and put it in the column in the near future.

To the newcomer to CW operation, the variety of available keys and keying equipment must be bewildering, indeed. In order to try to make some sense of it all, we will discuss the gear in three groups — manual, mechanical, and electronic.

Manual keys range from compact heavy-duty models designed for incorporation in military transmitters, to flashy works-of-art on marble bases, costing many dollars. A Morse key is really nothing but a switch, and you could use any on/off switch as a key. You could make a quite functional key out of scrap timber and junk metal, but before you spend a lot of money on a 'good' key, it is important that you understand what you are paying for. The most important factors are ease of operation and operator comfort. There seem to be two basic designs in use among the amateur population. Most Australians would be familiar with the 'high-mound' round-knobbed key of the British pattern. Design follows function, and in this case, the structure of the key is determined by the operating style, which has the forearm held above the table. Americans, on the other hand, key with the forearm resting on the table, so a low-profile, flat-knobbed key is more appropriate. Why these two widely different styles have developed is beyond me, but it is safe to say that you should use the style which suits you best whether it is British, American, or Australian.

A problem with manual keys is that they get pounded, and therefore have a tendency to move around on the table. The solutions to this problem are legion. One of many found in "Hints and Kinks for the Radio Amateur" (published by the ARRL and available from WIA Divisional Offices at reasonable cost), is to place the key on two pieces of fine-grade sandpaper, glued back-to-back. Of course, the only fool-proof method is to bolt or screw the key firmly to the table, but this method has the drawback that the location of the key is fixed (and it is definitely not the way to win the heart or co-operation of the XYL if you have to operate from the dining room table!).

Mechanically, most people seem to prefer a key with a great deal of inertia in the key lever, so a fairly massive bar is preferred. Additional mass is given to many keys by building them onto a heavy metal base, or even marble base, which helps to keep the thing in one spot, as well as contributes to the price. As far as the engineering of the key is concerned, there isn't a whole lot of variety. Adjustments to spring tension and contact spacing is usually, if not always, provided for, but you should ensure that once set, these adjustments won't move. Contacts should meet squarely or arcing will cause a build-up of dirt. Contacts should be cleaned by drawing a piece of paper between them; **they should never be filed.**

If there is an apparent need to file the contacts, something else is grossly wrong. Most of the keys readily available to the amateur are of good quality, and it is just a matter of finding the one that 'feels right'. The cheap and nasty keys that come with practice oscillators should be avoided like the plague, or you will develop bad keying habits in order to compensate for a bad key.

The best advice for the prospective purchaser of a key is to try several varieties, so you can determine the type that suits you best — before spending a lot of money on the 'lifetime' key, with contacts of gold.

The ordinary manual key cannot be beaten for simplicity and ease of operation, but there is still a lot of room for improvement. Some truly marvellous machines have been devised to simulate the actions of the hand in sending dots and dashes. Driven by springs and/or weights, they are all mechanically complex.

Basically, mechanical keys fall into two categories, semi-automatic and automatic. Either variety can be driven by a single paddle, which is moved to one side for dots and to the opposite side for dashes, or by separate dot and dash paddles. The semi- automatic variety will send a string of precise dots when the dot lever is actuated (or when the single paddle is swung to the dot side) but dashes are produced manually. There is often a problem in matching the speed of the dashes, or their spacing, to the mechanically generated dots, and if the dots are sent too quickly in relation to the dashes, the sending rhythm is distorted and the result can be very difficult to copy.

Electronic keyers come in three basic types — manual, single paddle (side-swiper) and dual paddle (the Iambic, or squeeze- keyer). Oddly enough, the 'manual' electronic keyer is the most recent in development. I have designated it a manual keyer because it is driven by a straight key. Called the 'Fist Fighter', it acts as an electronic interpreter; it receives sloppy signals you generate with a hand key, determines whether you intended to send a dot or dash, and generates a precise dot or dash for your transmitter, with appropriate spacing. I expect one would have to be reasonably consistent to make the thing work, so one would have to assume that if the 'Fist Fighter' can read your sending, a human ear should have no trouble. 'Fist' is usually defined as a distinctive sending style, and as such, is something to be frowned on — every operator's goal should be to send 'copper-plate' Morse which is not distinguishable from perfect, computer generated Morse, so this is the area where the 'Fist Fighter' should be of benefit. In other words, it enforces a discipline on the user, and ultimately trains one to send code so well that aids are no longer needed.

We will continue with electronic keyers next month. 73 till then.

AR

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW. 2077

Well, we've made it to another year, and I wish you all the best for 1986. I hope you all had a good festive season, and have a couple of dollars left after all the expense that goes with it!

I have written to the DOC and asked them to remind the USSR of their promise to remove the offending station "UMS" from the 15 and 20 metre amateur bands.

Some positive action has been taken re an Australian intruder, viz: Radio 5AN, Adelaide. The ABC has told us (via VK5GZ and VK5TL), that they are taking steps to remove the fourth harmonic from 3.564MHz. Nice to get some good news once in a while.

DAYLIGHT SAVING CHANGE

The Wednesday Intruder Watch Net, formerly on 3.540MHz, is now held on 3.595MHz, at 1030 UTC, but during Australian daylight saving, as last year, the time will be 1000 UTC. Anyone, of course is welcome to join in, **if you beat the QRN!**

DESTROYED BY FIRE

The nuisance intruder on 7.098MHz, "RRI", from Indonesia on AM, recently had their studios destroyed by fire, but the transmitter survived. *(I'll have to tell our man in Indonesia to make sure he gets the transmitter next time! ! !).*

CYCLING ON

News has it that the upcoming solar cycle (22), will be well below average, which is bad news, so we may have to wait until cycle 23 to get ideal conditions, once again. But at least it has to be better than it has lately. Intruder activity is increasing, particularly on the lower bands, due to the state of the cycle.

We hope that they will QSY to their own frequencies when the conditions improve.

A lot of jammers have been heard on 40 metres also, of late.

FIRST CERTIFICATES

In this column for November 1985, I mentioned the striking of an Intruder Watch **MERIT CERTIFICATE,** to be awarded annually to those persons who had given good support to the IW in the previous 12 months, irrespective of Divisional location.

I have much pleasure in announcing the recipients for 1985:

Col Robertson VK4AKX Certificate No 001
Robin Harwood VK7RH. Certificate No 002
Ivor Stafford VK3XB..... Certificate No 003
Jeff Wallace VK5BJF .... Certificate No 004
Frank Hine VK2QL..... Certificate No 005
Norman Richardson VK4BHJ .....
..... Certificate No 006

Congratulations to these people, and I hope that they will accept the Certificate as a measure of our thanks for helping out so well. A lot of other people were in the running for 1985, and no doubt will qualify in 1986.

THANK YOU

It is time to again say thank you to those who sent in reports of intruder activity for September 1985: *Peter Boskos, A Bradford, and VKs 2BQS, 2DEJ, 2PS, 2QL, 3BGH, 3XB, 4AKX, 4BG, 4BHJ, 4BTW, 4KHZ, 4MR, 4NUN, 5BJF, 5GZ, 7DQ, 7RH, and 8HA.*

AM Intruders reported totalled 335; CW 141; RTTY 74; with 22 on other modes, and 76 intruders identified.

JUST REWARD!

I have just received the news that Peter Boskos, mentioned above in the list of observers, a SWLer who has been supporting the IW for some time, now has the call sign of VK2KPI — **well done Peter.**

Thanks also to VKs 5TL, 5GZ, and 4AKX for information received re intruders.

See you all again next month, and I will look hopefully to the mail for contributions to the **Intruder Watch.**

AR

Whilst there may not be very much DX on the bands, there is still plenty of Intruders making good use of some amateur bands.

Make your listening time profitable by making out an Intruder Report and mailing it to your Divisional Intruder Co-Ordinator.

Spotlight on SWLing

Robin Harwood VK7RH
5 Helen Street, Launceston, Tas. 7250

Well, another year has arrived! It is sobering to realise that we are only 15 years away from the 21st Century! *I wonder what short-wave will be like then?* I expect that modes such as CW will have been replaced by SITOR or similar micro-processor-related systems in the commercial sphere. Every month, I am hearing more utilities switching over to Telex by Radio (TOR), which gives increased security and accuracy. When I look back on the number of HF coast stations 15 years, or more, ago, there were only a handful of stations using it, mainly in the USA, but today, more are going over to SITOR. This is primarily because the equipment is readily available, and economical to use.

SATELLITES IN USE?

Will we also see some HF services disappear, only to return using geo-stationary satellites to pass their traffic? Yes, I think that will be so, especially in the technologically advanced nations. However, the high outlays involved in satellites, and their ancillary ground equipment, could be beyond the reach of some developing nations, who will find it more economical to continue using HF.

Will there still be stations, such as the BBC World Service, Radio Australia, or Radio Moscow heard on short-wave? At this point in time, it is too early to say. We could have direct broadcasting satellites (DSB) on television. This could appeal to the average man-in-the-street, as it would be the ability to see rather than hear. Yet, DSB does have its limitations, mainly the number of channels are limited. I would expect that the larger organisations, such as the BBC, United States Information Agency, Japan's NHK, or American commercial TV networks, could be interested. It depends on the size of the audience. The different television technical standards are also a problem with broadcasting from satellites.

Interestingly enough, the USSR already uses DBSs to relay their domestic radio and television to the Far East and Siberia. I believe that some enthusiasts in New Zealand have received Soviet television via satellite. Viewers in North America and Europe have been able to do this for a couple of years. The Soviet system is fed by DBS onto a standard Soviet UHF channel. Our AUSSAT is not a direct broadcasting satellite, as it is only for subscribers, who require specialised decoding attachments and an earth station to receive the TV feeds, as well as being in the SHF range.

MOST VIDEOS

It is highly probable that cable, or subscription television will be restricted here, in Australia. For a country the size of Australia, the economic outlays would be considerable, so it will probably be in a restricted area. I believe there are some legal problems involved in its introduction. As Australia has the highest number of videos per capita in the world, it is more feasible to install videos than cable or subscription systems.

INTERFERENCE

Videos have introduced problems for the amateur radio operator, as I can recently attest. These are susceptible to nearby RF fields and pass them onto your television, *or should I say **their** television!* The average viewer is not interested in the technical complexities behind the problem, and wishes to enjoy their viewing without annoying herringbones on the picture, or "duck-talk" on the audio. The proliferation of sophisticated micro-processor controlled electronic equipment into the family home, has made life so much easier, but in turn has caused problems for the average amateur, especially if he/she lives in a built-up area. It is increasingly difficult to avoid getting into somebody's electronic system, and the easier way-out to satisfy the viewer is to silence the annoying amateur. Although technical modifications are available to suppress any stray RF fields entering to the circuitry, the complainant is often reluctant to have this done. *Will this restrict the HF operation in suburban areas by amateurs?* I think it has in some areas. Many operators are now wishing they had a little farm, or shack, down by the sea, well away from any potential TVI and EMC hassles.

Perhaps that is why I mainly listen these days, instead of enjoying a ragchew. The hobby is not what it used to be. With the virtual information explosion related to the theoretical and technical sides of the hobby, it is increasingly difficult to keep abreast. The number of old-time amateurs are decreasing, and radio is all computerised into milli-second pulses.

DELIBERATE JAMMING

While listening around, have you encountered a pulse that sounds like an ambulance Klaxon? This is no OTHR system, but an ordinary jamming station, quite unlike the usual "white noise" or over-modulated audio that one usually associates with jamming. It is located in the Middle East and broadcasts from the BBC, Syria, Deutsche Welle, the VOA, and, in particular, Iran have mainly been affected. There has been a major conflict in the area for about four years now, and both sides have been making extensive use of propaganda via radio, and one group have now reacted by deliberately jamming the others programming.

The Iranians have launched a clandestine outlet, which is mainly in our exclusive 40 metre allocation. This is rather difficult to hear as the jammer is very effective, and it is easily observed here. Between 1200 and 1300 UTC, on approximately 7.086 or 7.051MHz, it is easily heard, also on 7.105MHz.

INTRUDERS

Another broadcaster has appeared on our exclusive 7MHz allocation. "The Voice of Greece", in Athens, is on 7.095MHz in Greek, from 2100 to 2150 UTC, **beamed to Australia.** I seem to recollect that the same broadcaster operated on 21.445MHz, just inside our 21MHz allocation, which was also to this region, a few years ago. The signal was fairly strong, and was also on its usual channel of 9.420MHz, but not as strong. It appears as if intruders are now a fact-of-life. Although the Chinese power-houses on 7.025 and 7.095MHz are gone, it has been observed that, there is yet another lower level signal in one of the minority languages on at 1230UTC.

Radio Beijing is heard in Russian, on 7.025 and 7.035MHz, but are well down underneath the jammers. The Chinese have, in fact, dropped down to 80 metres, as from October. They have re-appeared on 3.535 and 3.640MHz, in parallel. This usually happens in their winter season. We have, as well, our usual quota of summer atmospherics, which have been quite severe at times. Fortunately, propagation on the higher frequencies has improved slightly during our evening hours.

Incidentally, Radio Australia's "Talkback" programme has now been slotted to Saturdays at 0310 and 0810 UTC. There are other releases, but I don't have these to hand. The BBC's "Waveguide" can also be heard at 0750 UTC, on Sundays, repeated at 1115 UTC on Tuesdays, and 0430 Wednesdays.

RELAXING WITH A GOOD BOOK

I recently obtained a copy of the book "From Wireless to Radio" by Bill McLaughlin. It is not a technical book, but rather the story behind Broadcast Station 3DB, in Melbourne. It is a history of the station's development from 1927, up to the present time, concentrating on the on-air personalities from the 20s to today. It is certainly very readable and brings back memories of the programmes I heard in my early listening days.

It has been published by the Herald and Weekly Times, who own the station, and costs $11.95 posted[1].

Well, it only leaves me to wish you a happy 1986, and hope you enjoy listening during this year. Until next time, the very best of 73 and good listening — Robin VK7RH.

1 Herald and Weekly Times, 44-74 Flinders Street, Melbourne, Vic. 3000.

AR

ARMED RAIDERS HIT ELECTRONICS RETAILER

Communications equipment, worth in excess of $23 000, stolen during an armed hold-up at the premises of Amateur Radio advertiser, GFS Electronics, could be used for criminal activity.

Three gunmen raided the premises in November, terrorising the manager, Greg Whiter, his seven year old son Bradley, and two employees, Alf Thompson VK3DFW, and a female office assistant Karen. They were forced into a rear store-room, bound, blindfolded, and gagged as the bandits demanded two metre transceivers and cash.

Greg said the men required amateur band hand-helds, but there were none in stock. Greg was struck over the head after telling them where the cash was kept, but they couldn't find it and thought he was just stalling them.

Greg 'saw stars' when hit, and needed medical treatment for a cut head. Greg and Alf also had their wallets stolen.

One of the bandits brandished a pistol, another carried, what was believed to be, a double-barrelled shotgun. The first was about 40 years old, 183cm, brown greying hair, olive complexion, and of medium build. The second was in his early 20s, 175cm, short fair hair, fair complexion, and medium build. The third wore a stocking mask. More voices were heard by the victims, and police believe the two bandits could have been joined by accomplices.

The Nunawading CIB and Armed Robbery Squad are in charge of investigations into the crime.

Equipment stolen was as follows:

30 SX-155 Programmable Scanners (new) Serial Numbers Unknown
1 SX-155 Scanner (used) S/N 6715029
1 SX-155 Scanner S/N 6715001
2 FS-10 10 channel Pocket Scanners S/N 5861
1 C-800 10 channel Pocket Scanner S/N Unknown
2 ATC-720X Airband Transceivers S/N 710180, 710009
26 G58 5/8 Telescope Antennas
1 CH-1502 Charger S/N 13457
6 FRP-501 Fire Pagers S/Ns 15084, 15101, 15091, 15100, 15085, 15095
5 AR-2001 Scanners (new) S/Ns Unknown
1 AR-2002 Scanner S/N 00381
3 C-900 Talkman Transceivers S/Ns 80029, 90109
6 M25T VHF HiBand Whip 5/8 Antennas
6 M22T 1/4 W VHF HiBand Antennas
Also about 25 various crystals.

Any members offered any of the above equipment are advised to contact the above Police Departments or your local Police Station.

AR

AWARDS MANAGER

All members interested in collecting awards please note that, from the first of this month Ken Hall VK5AKH, will take over the role of Awards Manager. All applications for WIA awards and award material for inclusion in these pages, should now be directed to Ken at *St Georges Square/Rectory, Alberton, SA. 5014.*

A R Showcase

EMTRONICS OPEN IN VICTORIA

The 1st November 1985 saw the opening of Emtronics in Melbourne. This Sydney based company has established an outlet at 288-294 Queen Street, Melbourne, with the entrance off Little Lonsdale Street, becoming the "amateurs end of the city" for the VK3 amateur.

Much thought has gone into the setting-up of this operation, with adequate displays which customers may view (as the photograph depicts), and customer liaison that is available.

Parking is readily available for participating buyers, also a cup of coffee and the expertise of Fred VK3ZZN and Tracey who are the custodians of the electronics complex.

Don't be shy, call in and see a break-through in electronic purchases, meet Fred and Tracey over a 'cuppa', and discuss your requirements, or give them a call on (03) 67 8551 or 67 8131.

AR

SCALAR GROUP

Scalar antennas have made a name for themselves, both in Australia and overseas, in the professional communication market.

Those who use the company's products realise the success of a communication system's overall performance depends on precision antenna engineering to exacting electrical and mechanical specifications.

Scalar Industries was formed in April 1973, when the British-owned Belling and Lee company closed its Australian operations. Managers of Belling and Lee formed Scalar and, with experienced engineering and manufacturing personnel, set out to design antennas to meet the requirements of industry and government. That objective was achieved, and Scalar antennas are to be found in a wide range of applications on HF, VHF, UHF, and Microwave.

For example, the company is the prime supplier for antennas used by Telecom's mobile telephone service. Also the Defence Department, OTC, Emergency Services, Railways, Taxi Services, Paging Systems, and Broadcasters, are just some of Scalar's customers.

Scalar prides itself on its Research and Development Department, which is up with market trends and comes up with answers to antenna application problems.

Its headquarters, at Kilsyth, in eastern suburban Melbourne, has a test range to ensure their products performance and specifications.

As well as supplying antennas, Scalar have a full range of accessories — dummy loads, coaxial switches, cable harness, coaxial connectors, cables, mounting hardware, signal splitters, duplexers, cavities, and low noise amplifiers, to name but a few.

The company also stocks, and is agent for a variety of imported specialised communications equipment, and have just released some new antennas.

The Tunable Mobile Coaxial Dipole Antennas, BFB1, BFB2, and BFB3 have been added to the Scalar range of ground independent mobile antennas and are primarily designed for installation on vehicles operating in off-road, and other heavy duty situations such as road construction, mining, and emergency situations. They are also admirably suited as base antennas.

The antennas are enclosed in specially reinforced fibreglass radomes. They are field tunable throughout their range — 70-85MHz, 118-136MHz, or 148-175MHz.

The Scalar HM12 series of HF Marine Antennas (2-10MHz), have been designed to provide economical and reliable communications for small craft. The radiating elements in these whips have been impregnated into the fibreglass wall during manufacture to ensure durable long-life structure.

The bulk head mount caters for sloping or vertical cabin sides. These units are designed to operate effectively down to 2MHz when used with a HF tuning unit.

For further information about the Scalar range of products contact Scalar Industries Pty Ltd, 20 Shelley Avenue, Kilsyth, Vic. 3137. Telephone: (03) 725 9677. There are also Branch Offices in Sydney, Brisbane and Perth.

AR

TARA PATCH

A new phone patch unit for radio amateur operators has performed exceedingly well during tests between Melbourne and Gippsland.

Using an FT101B transceiver, the Tara Patch gave good audio quality, and was easy to operate. An in-built speaker allowed the radio operator to monitor both the off-phone conversation and off-air audio.

Manual switching from transmit to receive was a simple operation — and enabled full control over the third party traffic being patched.

Tara Patch is Telecom Type Approved, and replaces an earlier version which was available last year. Considerable developmental work has gone into the new model to overcome RFI problems, which appeared in some circumstances with the earlier version on HF.

The unit is more than a phone patch — it provides the permanent interfacing of up to three transceivers at the flick of a switch, it is a complete 'ready-to-go' unit, and has adequate printed instructions and circuit diagram.

Inquiries may be directed to Tara Systems Australia, 6 Malvern Street, Bayswater, Vic. 3153. Or phone (03) 729 0118.

RTTY/CW COMPUTER INTERFACE

A computer interface designed to connect to a radio transceiver or receiver, and allow computerised RTTY/ASCII/AMTOR/ARQ/FEC/CW operation, is now available.

Known as the Model MFJ-1224, and manufactured in the USA by MFJ Enterprises, it offers its users a number of unique features. For example, it may be used on most of the common computers available today due to its versatile I/O circuitry. Included in the units price is a CW/RTTY software cassette to suit the VIC-20/C-64.

The MFJ-1224's design makes use of a sharp eight pole, active filter when in the 170Hz shift or CW modes. This, coupled with its XR 2211 PLL detector provides good copy from almost unreadable signals. It is capable of operating on 850 and 425Hz, as well as the 170Hz shifts.

Signal tuning is made relatively easy due to its two LED tuning system. A reverse/normal sense switch is also provided for receiving reversed signals.

Operation on modes such as AMTOR, ARQ, and FEC, are accommodated by the MFJ-1224 interface, provided its host computer has the appropriate software. A single DC power source of 12 to 15 volts is all that is required for its operation.

The unit is priced at $345 plus $14 p&p from the Australian distributors, GFS Electronic Imports, 17 McKeon Road, Mitcham, Vic. 3132. Phone: (03) 873 3777.

AR

LOCAL MOBILE RADIO

Amalgamated Wireless (Australasia) Limited, (AWA), has transferred the manufacturing of its RT-85 Mobile Radio from Japan to its New Zealand based company, AWA New Zealand. This allows for reciprocal manufacturing advantages as New Zealand manufactured communications equipment is considered 'locally' made by Commonwealth and State Government departments.

AWA Land and Mobile Communications Manager Don Jamieson (left) and AGL Operations Manager Brian Chapman, holding the first New Zealand manufactured RT-85.

AUSTRALIA'S FIRST UHF-ONLY TV NETWORK

From 5th January 1986, VHF Channel 0 will cease transmission in Melbourne and Sydney, making SBS-TV Australia's first UHF-only television network.

The network, the multi-cultural television arm of the Special Broadcasting Service, will continue its transmissions in both cities on the existing UHF wave-length. This move follows the Federal Government's decision to make SBS-TV a UHF-only network, and place future television extensions on the less-congested UHF band.

The current VHF band is widely used by TV and FM radio stations, leading to overcrowding of the wave-length. By making use of the UHF band, transmission services will be clearer, crisper, and less prone to interference.

When SBS-TV began transmission as Channel 0/28 in October 1980, it was available on VHF Channel O and UHF Channel 28. Since then, the network's expansion has been on the UHF band only. The use of the VHF 0 signal was only a short-term proposal by the Federal Government to allow viewers time to appreciate the new network, and gain a complete understanding of the then-new UHF television.

Viewers should have little difficulty receiving adequate UHF transmissions, provided they have the correct equipment, which includes a television set or VCR with UHF capabilities and, in many cases, a suitable outdoor UHF antenna.

For further information contact SBS-TV Publicity, Sydney (02) 923 4811/(008) 22 6322 or Melbourne (03) 690 5233.

VK3 WIA Notes

WIA VICTORIAN DIVISION
412 Brunswick Street, Fitzroy, Vic. 3065

NEW MEMBERS

A warm welcome is extended to the following members who joined this Division during October 1985.

J Bradshaw VK3ZFM; Graham Burton; H Crow; Gary Evans VK3XGE; Frank Foulds VK4BBN/ ZL3JI; John Gurney; Carl Jackson; Clinton Jeffrey VK3KJN; Dennis Jurisinec VK3ZRN; Kevin Leydon VK3KLK; F Lock; Ivor Lyell; Christopher Peake VK3KCP; David Ross VK3PKO; Max Scane; Joseph Taylor VK3CVB; George Wilson VK3KIJ; Gordon Yorke VK3ABI; Michael Xuereb VK3NMX.

AR

Ted Holmes VK3DEH, and Harry Kraehenbuehl VK3KBA, one of the regular team of announcers on the Sunday Morning Broadcast through VK3BWI. A regular feature when this pair is doing the Broadcast is Ted's "Trivia Quiz" for those who take part in the two metre call-back.

Photograph courtesy Jonathon Marshall VK3PRN

PUBLIC RELATIONS

The Public Relations activity of the WIA Victorian Division has been given a real boost following the donation of a video display unit.

Due to a kind donation from GEC Automation and Control, the sole Australian distributor of National brand professional and commercial products, the message of amateur radio is effectively reaching an audience.

Graeme Burbridge, presents the Video Display Unit to WIA Victorian President and Public Relations Officer, Jim Linton VK3PC.

Photograph courtesy Alf Chandler VK3LC.

The unit, valued at $4 000 is designed for the continuous displaying of video messages, and is widely used in retailing establishments. It has been installed in the Science Museum of Victoria, as part of the VK3AOM demonstration station.

When VK3AOM is not manned by volunteers, the passing public only have to press a button to see a six minute video from the WIA Videotape Library — Amateur Radio .. The National Resource of Every Nation.

Our sincere thanks go the Graeme Burbridge, National Sales Manager of GEC Automation and Control, for this generous donation, and the Science Museum of Victoria for its co-operation in having the unit installed.

The idea of having a video display facility came from Allan Doble VK3AMD, who negotiated, on behalf of the WIA, with both the Museum and GEC for almost a year. Congratulations Allan on thinking of the brilliant idea and riding it through to the winning post.

AR

Forward Bias

Ken Ray VK1KEN
Box 710, Woden, ACT. 2606

MEETINGS FOR 1986

The next Divisional Meeting will be held on 20th January, at the Griffin Centre, Civic. Doors open around 7.45pm, for the bookstall and QSL bureau, with the meeting commencing at 8pm. The Annual General Meeting for 1986 will be held on Monday, 24th February, at the Griffin Centre, Civic, starting at 8pm.

One of the functions of the AGM is to elect office bearers for the 1986 year. All members of the VK1 Division are eligible to stand for election to any committee position, and it appears that a number of long serving members may not stand for re-election. Any member interested in standing for a committee position should contact the Public Officer, Alan Hawes VK1KAL, for nomination forms and further details. Serving on the committee can be very satisfying, and need not be an onerous task if all pull their weight. This could be your chance to put something back into our hobby of amateur radio, and can be a very enjoyable and rewarding experience.

Also, at this meeting, there will be a motion to alter the constitution of the VK1 Division, to bring the rules regarding financial members into line with the new cyclic billing procedures for the WIA, as a whole.

VK1 AWARD UPDATES

Phil VK1PJ, has informed me of the VK1 Awards which have been issued up to 5th November 1985. These are:

VK7NAI	*Silver Upgrade*
VK2PXS	*Basic*
VK6OE	*Basic*
VK1ZXA	*Silver Upgrade — VHF*
VK1HZ	*Gold Upgrade*

Congratulations to all, particularly to those earning upgrades.

UHF BEACONS

Two new beacons are operating in VK1. Details are:

Call Sign — VK1RBC
70cm — Frequency 432.410MHz, Coaxial Collinear Antenna
23cm — Frequency 1296.410MHz, Slot Radiator Antenna
Mode — AFSK
Output Power — 10 watts

These are currently located at the QTH of Ron VK1RH, in Melba, one of the NW suburbs of Canberra. Both beacons were built by Dick VK1ZAH. Our thanks to Dick for his effort in constructing these beacons.

JOHN MOYLE FIELD DAY

Don't forget the Annual John Moyle Field Day Contest — the VK1 Division will operate a serious station, this year, as opposed to a demonstration station, as in past years. We will need operators and equipment — contact any committee member for further details.

AR

Pamphlets showing the syllabus for the AOCP and NAOCP examinations are now available from the Department of Communications

Intending candidates should obtain a copy of the appropriate paper, prior to the May 1986 examination.

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

DIVISIONAL OFFICE
The telephone number for the Divisional Office is (02) 689 2417.

BROADCASTS
The VK2WI Broadcasts ended for 1985 on 22nd December. The first 1986 broadcast will be on 12th January.

DIVISIONAL OFFICE
The Divisional Office will be closed over the holiday period. It closed on 20th December and it will not open again until Monday, 6th January.

AGM 1985-86
Members are reminded that the Divisional Year ended on 31st December. It is now the time for the various sub-groups to submit their reports for inclusion in the President's Annual Report. The AGM will be held on the first Saturday after Easter.

The new year also brings the requirements of a new Council and members are requested to consider serving on the Council. Besides needing to be able to attend the monthly Council meetings, you need to be able to attend the Parramatta Office on a regular basis to carry out some of the other duties which form part of Council involvement. Nomination forms are available from the office.

CENTRAL COAST FIELD DAY
Mark you appointment book for the third Sunday (16th) in February, for the Central Coast Field Day.

NEW BEACON
The latest Divisional Beacon went on air on Sunday, 3rd November 1985. The 23cm beacon is on 1296.420MHz, with approximately five watts omni-directional antenna, horizontally polarised, 30 metres above ground, and located at Dural (about 270m ASL). Reports are sought and a QSL card will be sent for all cards and written reports received.

It is part of the VK2RSY system and is keyed from the common identifier.

JOHN MOYLE MEMORIAL FIELD DAY
Are you ready for the 1986 event? No doubt you saw the 1985 results in Amateur Radio. Wagga ARC took out the Open 24 hour Section with 16 500 points and Oxley Region ARC the six hour Open Section with 1607 points.

How about you club setting up a station this year?

FOR SALE
The Divisional Store has available a quantity of 10.700MHz crystal filters. The are from two manufacturers, Hy-Q and ITT, for printed circuit mounting. Frequencies are 10.700MHz ± 7.5kHz. For personal or mail order sales, they are two for $5.00 post paid.

REPEATERS
Repeater applications for a two metre system to serve the Tumut area, and a 70cm unit at Wagga were received in November 1985. Both were well presented and documented, and required only checking with VK1 and 3 to determine and confirm suitable channels. It is expected that by the time these notes are published they will be ready for license submission.

During November, repeater groups were sent a pager interference report concerning some systems in the 147-148MHz segment. Investigation is continuing into this matter. Amateurs receiving (pager) interference to other repeaters or simplex channels in any mode, any band are asked to advise the Divisional Office, via the Post Box address, or phone (02) 689 2417, 11am to 2pm, Monday to Friday, or Wednesday evening, 7 to 9pm.

REPEATER ABUSE
Most readers will be aware that, in recent times, much of the anti-social behaviour on ch 7000 has ceased. There are still some pockets of abuse directed to certain people whenever they come on air, or problems arise where some operators appear as though they should be subjected to a RBT prior to operating.

After a long period of investigation by various authorities, a person located at Ryde, was arrested and charged with harrassment, by telephone, of several amateurs in Sydney. There were also drug and fire-arm related charges. The various charges brought financial ($1600) and community service (200 hours) fines. Information gained during these investigations by the authorities are helping with other matters which should see a further clean up of the problems.

BLANK QSL CARDS
A re-print was recently completed and the full colour range is again available.

Copies of the latest Call Book are still available, together with most publications and clothing. Check during office hours for the availability of any of these items.

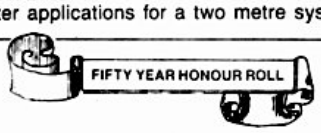
HOME-BREW CONTEST
Building something during the holiday period? Why not enter it in the present contest? This contest closes at the end of February. The results will be announced at the Seminar, in March, which is scheduled to be held on Saturday, 8th March.

NSW AWARDS
The Division is considering the introduction of some awards. The type to be chosen is still being looked into, but are expected to be along the lines of the VK3 National Parks, or the VK4 Shires awards.

Any input from members would be most welcome.

In closing, may I, on behalf of the Division and its office bearers, wish all members the best for this New Year of 1986.

AR



In response to the Editorial in November Amateur Radio, page 7, Alan Shawsmith VK4SS, has written to advise that he has been a member of the Institute prior to passing his AOCP in August 1935. Alan is very active today compiling historical articles for the VK4 Division, and this magazine.

Austine VK3YL, has been a member for 56 years, and has been licensed for 55 of those years. Austine is still very active 'chasing DX', and is as keen on the hobby today as when she first became interested.

Ivor Stafford VK3XB, (Life Member of WIA) has been a member of the Institute for 51 years. Ivor has always been very active in Institute affairs. He was Outwards QSL Manager in Victoria for 14 years and was also Victorian Intruder Watch Co-Ordinator for quite a period. Ivor continues to work for the Intruder Watch and is recipient number three of the newly inaugurated Intruder Watch Certificates (see Intruder Watch column), which are awarded for support to the Intruder Watch. Ivor is a keen CW-man, and his name can frequently be seen in the contest column results. He is also heard regularly on the HF bands chasing the elusive DX, usually on CW! Ivor helped to celebrate the 75th Anniversary by using the VK75A call sign and also attending the Dinner on 9th November 1985, with his charming XYL, Mavis VK3KS.

Bill Seivers VK3CB, began experimenting with amateur radio during 1918, and joined the Institute in 1922. Bill is still an active participant in the Institute, and was seen to be enjoying himself at the 75th Anniversary Dinner, last November.

VK4 WIA Notes

Bud Pounsett VK4QY
Box 638, GPO, Brisbane, Qld. 4001

SEEN AT THE QUEENSLAND RADIO CONVENTION 1985

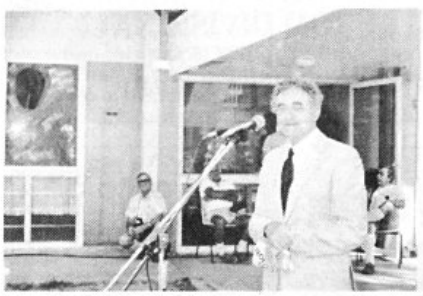
LEFT:

FROM LEFT: Ron VK4EN; Bernie VK4FOS; Betty VK4BET; Charlie VK4IQ; Lloyd VK4ALW; Max VK4BMW; Evelyn VK4EQ; Richie VK4RR; Les VK4LZ; Alan VK4PS; Ross VK4RO; Bill VK4XZ; Gordon VK4AGZ; Roger VK4CD; Bob VK4WJ; Ian VK4ZT.

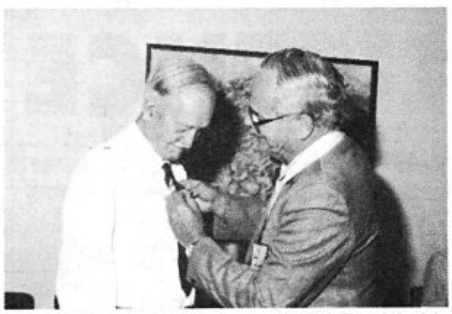
BELOW:

FROM LEFT: Guy VK4ZXZ, VK4 Federal Councillor, Brian VK4RX, QTAC, Charles VK4BPI, MARC President, Colin VK4EX, CARC President, Roger VK4ARZ, Mt Isa Club Secretary.

FRONT FROM LEFT: John VK4QA, VK4 President, Ann VK4KXZ, VK4 Bookshop, Val VK4VR, VK4 Service/Liaison, Bob VK4WJ, TARC President.



Professor James Ward of James Cook University performing the Opening Ceremony.

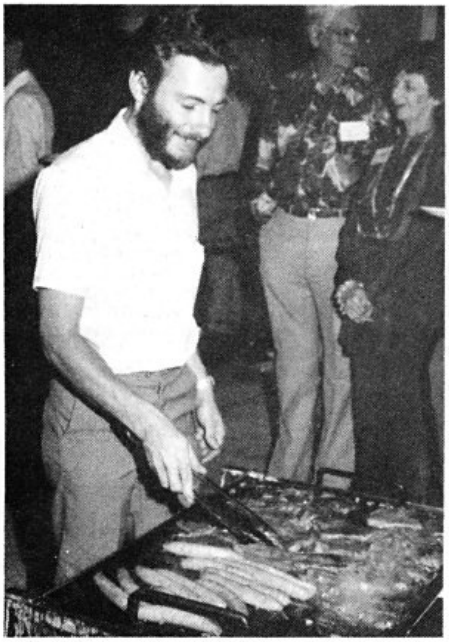


John VK4QA present Les VK4LZ with his WIA Merit Award Badge.

Charlie VK4IQ.

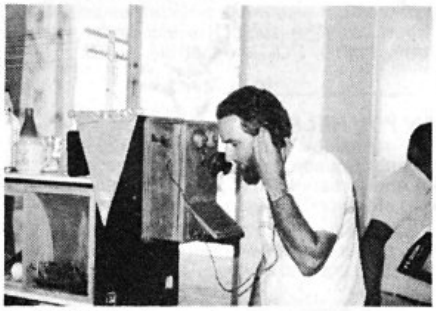
Max VK4BMW and John VK4FNQ, joint winners of the Ed Roche VHF Achievement Trophy, are presented with the Trophy by Ed VK4KAA.

Don Bryant (left) and Col VK4ZCR, updating registrations at the Convention.



Cook for the Convention John VK4AFS, carefully watched by Ken VK4KT and his XYL, Judy.

Dale VK4KDM.



Bob VK4WJ checks the Historical Display.

Club Corner

VICTORIAN AMATEUR TELEPRINTER GROUP

Following a committee meeting held on 30th October 1985, it was resolved that, as from the first RTTY Broadcast for 1986, a frequency change from 3.545MHz to 3.630MHz will be implemented.

This frequency change will be in line with the recommended Band Plan for Region 3 RTTY Broadcasts.

It was further decided that the BAUD rate for these broadcasts will stay at 45.45 BAUD until further notice, as the committee sees no useful purpose to change BAUD rate until it is a world-wide decision.

The RTTY Broadcast frequencies from this month are:

Two metres VK3RTY Repeater 147.350MHz receive.
Call back on 146.600.
HF 3.630MHz VK3REC.
Call back frequency will be announced during the broadcast.
Date/Time — Tuesdays 0900UTC.

A clear frequency would be appreciated.

Contributed by Lindsay VK3KAF
Chairman VATG

CENTRAL COAST AMATEUR RADIO CLUB

All amateur radio operators, their families, friends, and all interested in amateur radio, are invited to attend the Club's 29th Annual Field Day, to be held on 23rd February 1986, at the Showground, Showground Road, Gosford, NSW.

Events of the day will include: *Open Scramble, Pedestrian Direction Finding Fox Hunts, Pedestrian Talk-In Foxhunt, Ladies and Gents Quizzes, a Ladies Stall, Children's Events, Visit to the Reptile Park, and an Afternoon Bus Trip.*

Catering arrangements will be the same as last year — BYO Picnic Lunch or buy from the Take-Away Food Bar at the Showground. Free tea and coffee is available from 8am to 5pm.

Early booking for accommodation is advisable, as accommodation is usually scarce at Field Day time.

Trains arrive at Gosford Railway Station, from Sydney and Newcastle between 8.30 and 10.30am, and courtesy bus transport is provided to the Showground.

The Field Day will be held rain, snow or hail, as there is plenty of shelter at the Showground.

The VK2 QSL Bureau will be in attendance, and bring a QSL card for the 'Calls Present' board.

For information write to CGARC, PO Box 238, Gosford, NSW. 2250, enclosing an SASE.

AR

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

In the October issue of Amateur Radio 1985, we published a photograph of a group who never quite made it for the Australian first XI, but nevertheless, had some fun playing cricket, possibly at a WIA picnic.

Brian Austin VK5CA, and Tom Laidler VK5TL got their heads together, along with some information sent in by Colin Hewitt VK5CT, and between the three of them, they have come up with the names of most of the gentlemen in the photograph. They are as follows:

Top row from left — Jim Vivian VK5HO, unknown, Jim Rosevear, Gilbert Lucas VK5LL, John Bulling VK5KX, and Gordon Bowen VK5XU.
Front row from left — Joe McAllister VK5JO, Len Baker VK5OC, Warwick (Pansy) Parsons VK5PS, Clem Tilbrook VK5GL, and Colin Hewitt VK5CT.

Thank you for taking the trouble, gentlemen.

OUT-OF-DATE

Although, by the time you read this it will be somewhat out of date, I felt that mention should be made on the resignation of John Mitchell VK5JM, as WICEN Director in VK5. John has been involved in WICEN for 14 years altogether, from 1960-64 and from 1975-85. Not that John is going to drop out of sight straight away. He will be on hand to advise Bill Wardrop VK5AWM, who will take over the role of Director from John, and also to get a "Rapid Deployment Group" off the drawing board. On behalf of the VK5 Division, our thanks for all the time and effort that you have put into the position, John.

ELECTRONICS SHOW

Also, somewhat ancient news is my report on the News Electronic Show, at Morphettville. When Bob Allan VK5BJA, agreed to put up the aerials for me, we assumed that we would be on the second floor, where we had been for the past two years, so it was with some consternation that Bob and I viewed our site for this year — on the ground floor, with no easy access to the roof. However, with the help of Jack VK5FV, Lindsay VK5GZ, and Peter VK5PRM, aerials were raised on the roof, and as Siberia and Japan were worked, we must have been getting out okay.

The fact that we had a larger site this year didn't daunt Peter Koen, he just brought along extra display material, including some on JOTA and the amateur involvement in the Mexican Earthquake. Incidently, Peter's daughter, Michelle, was featured in two editions of the "News" that week, advertising our involvement with JOTA, the first with David Clegg VK5AMK, and a Scout, in David's shack; and two days later on her own, as a Guide.

Grateful thanks to the following VK5s who volunteered, or were otherwise coerced into becoming operators.

John VK5NX; Vince VK5ZSV; Max VK5NMX; Jack VK5FV; Colin VK5FX; Bill VK5AWM; Ron VK5AAC; Steve VK5AIM; Steve VK5AOZ; Tony VK5AH; Meg VK5AOV; David VK5OV; Ken VK5AGW; and not forgetting Pauline Koen, who came to help with the display boards. (This year we didn't have to scrounge furniture, we only had to ask!).

To all those mentioned, and anyone I may have forgotten, plus the amateurs who called in to visit us — again THANKS! !

AR

QSP

HALLEY'S COMET

James Young WB6FNI, will operate from the Jet Propulsion Laboratory's Table Mountain Observatory, where he is a resident astronomer, to commemorate astronomical observations of Halley's Comet during the International Halley Watch.

Operation will be limited to 40 metres during the months of February and March 1986, on a non-interference basis with normal observatory activities. Frequencies and times will be: *CW — 7.120 ± 5kHz from 0400-0500 UTC. Phone — 7.228/7.077 from 0500-0600 UTC; 7.249 from 0700-0800 UTC; 7.228 from 0800-0900 UTC; 7.228/7.084 from 0900-1000 UTC.*

A Certificate and an original 1986 Halley,s Comet photograph, taken at the Observatory will be available for 5 IRCs.

QSL via James Young, PO Box 576, Wrightwood, CA. 92397, USA.

Please note that some of these frequencies are especially for overseas amateurs and are out of the Australian allocation but SWLs may care to listen out for James on them.

Over to You!

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

BEST THING SINCE SLICED BREAD — WELL ALMOST!

"Plastic wrappers for Amateur Radio are the best thing since sliced bread". That and many other complimentary comments have been flowing in to the VK4 Divisional telephone since Amateur Radio changed its outer wrapping.

Several years ago, Alex McDonald VK4TE, and Dave Laurie VK4DT, recommended that plastic wrapping be used, but, at that time, suitable machinery was not available.

Now, dashing out in the rain to retrieve Amateur Radio from the mail box before it is reduced to a soggy mass of paper pulp in no longer necessary. Our monthly journal is securely encased against the elements.

I know that the inevitable teething troubles have caused the Editor and production staff some concern, however, it appears that those problems have now been overcome.

On behalf of the members in Queensland, I thank you all, and look forward to receiving Amateur Radio in pristine condition during the forthcoming 'wet season'.

Guy Minter VK4ZXZ,
Federal Councillor,
4 Angelina Street,
Macgregor, Qld.
AR

BATTERY POWER

Recently I read in the Rad Comm magazine that several transceivers are now totally dependant on an internal lithium battery. If failure of the battery occurs, these models have to be returned to the supplier for re-programming.

Subsequently, I asked several owners of this type of equipment for their opinion of this situation, and they were disbelieving, and assumed that the batteries were merely a "memory back-up" for stored frequencies.

From this point, I continued investigation by reading the equipment reviews in various amateur journals, none of which emphasised the importance of the batteries, and the necessity of returning the rig to the supplier.

Due to the remote locations of some Australian operators, this factor would be an important consideration when purchasing new equipment.

In the future, the life span of these batteries would have to be ascertained when purchasing second-hand equipment.

I look forward to receiving comments on this subject.

Yours faithfully,

John Baxendale VK6JD,
6 Dornoch Court,
Duncraig, WA. 6023
AR

SHOCKED AND DISMAYED

I am shocked and dismayed about the recent jump in examination fees imposed by the DOC.

If the Department cannot keep its fees down to a more acceptable level, the WIA should become the examining authority, with DOC endorsing the results of the exams by issuing the appropriate certificates.

DOC have now authorised approved training institutions to conduct exams for the BCOP and TVCOP with the Department issuing certificates on the results.

I believe that the increase in fees may discourage many young people from attempting the exams and eventually lose interest in this wonderful hobby of ours. This may result in the WIA not celebrating its centenary.

I strongly urge the Federal Council of the WIA to give immediate action to formulating a proposal to become the examining authority for all classes of certificate.

There are many older, experienced members of the WIA who would be well qualified to supervise examinations, on a voluntary basis, on behalf of the Institute.

This could be of great help in many country areas, where the candidates and supervisors should be able to arrange agreeable times and places for the examinations to be held.

Yours faithfully,

Don Martin VK2ARQ,
80 Greenbah Road,
Moree, NSW. 2400

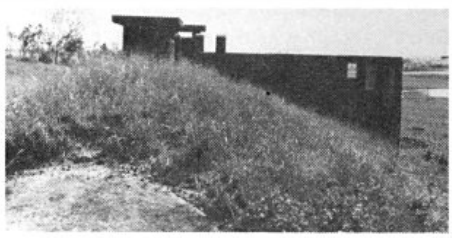
The Institute has expressed great concern to DOC. Possibility of WIA running exams has been considered but would need numerous volunteers in all states. The subject is still under intense scrutiny, both by DOC and the WIA. — ED.

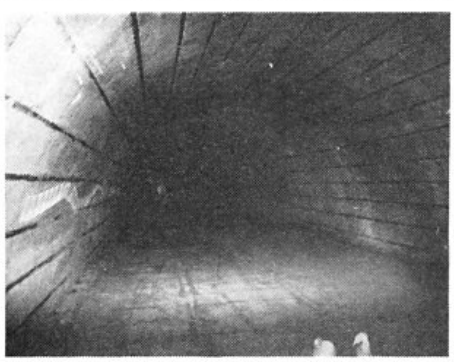
AR

CAN YOU HELP?

I am researching the history of 23 (City of Brisbane) Squadron RAAF in preparation for its 50th Anniversary, in April 1987. The Squadron was based at Lowood, Queensland, from 1940 to 1944.

I am trying to locate any ex-members of the Army or Air Force who served in the signals bunkers adjacent to Lowood Aerodrome.





The accompanying photographs show one of the bunkers, which is built into the side of Mount Tarampa. The other bunker is five miles (8km) distant, which suggests a remote transmitter/receiver arrangement.

I would be very happy for anyone who served in either of the two bunkers to contact me with any historical information as to their role during World War II.

Yours faithfully,

FLTLT P R (Ron) Burr,
No 23 Squadron,
RAAF Base,
Amberley, Qld. 4305.
AR

CONGRATULATIONS

It is my pleasant task to write and congratulate the Amateur Radio team for the way the the November 1985 issue was edited and produced.

AR came up at our Committee Meeting, and all said that they had enjoyed reading it, and had received very favourable comments from many other members of the Club: *interesting articles, well set out, and easy to read, were some of the compliments heard.*

Thanks very much for the work which goes into AR and keep up the good work.

Best regards,

Gordon Buchanan VK3BGB,
Secretary,
Frankston and Mornington Peninsula ARC,
PO Box 38,
Frankston, Vic. 3199.
AR

RETIREMENT VILLAGE

It was with special interest that I read the article from Harry Atkinson VK6WZ, on a need for a "Veekay" Retirement Village. I have been thinking along these lines for some time and providing that sufficient interest is shown by amateurs for such a needed facility, I would be willing to start such a venture.

The area I have in mind is near a large provincial town in Queensland, is reasonably close to beaches, and air access to southern states is readily available. Also, radio conditions are excellent.

Any amateurs who are interested can contact me at the following address.

73,

Ted Ross VK4ALQ,
PO Box 589,
Caloundra, Qld. 4551
AR

CORRECTIONS TO AMPLIFIER NOISE, NOVEMBER

A number of errors have crept into the above article.

(1) Page 18 — Figure 2 — "En" should be "Vn" to correspond with the text (my error).

(2) Page 18 — Formula should read:

$$F = 20 \log \frac{E_{no}}{\{A_v \sqrt{1.6 \times 10^{-20} \times B\, R_s}\}} \text{ dB}$$

(A_v is part of the denominator and in the printed article the 20 log and dB have become confused).

(3) Page 19 — Figure 4 — The general sense of the curves is OK, but somehow the draughtsman has reversed the log scale on both axes.

(4) Page 20 — Formula should read:

$$E_n = \frac{E_{no}\, 10^9}{\sqrt{B.A_v}} \text{ nV}/\sqrt{\text{Hz}}$$

(The square root only applies to bandwidth (B) not gain (Av).

(5) Page 20 — Formula should read:
$E_{no} = \sqrt{1.6 \times 10^{-20}\, BIR_s}$ V/$\sqrt{\text{Hz}}$
(Bandwidth (B) was omitted on the original typed draft).

(6) Page 20 — Figure 7 — Plate load resistor should have been labelled R_s — 50ohms.

(7) Page 20 — Figure 8 — 50k resistor should have been a variable resistor.

(8) Page 21 — Figure 11 — (17dB of N & D) should read (12dB of N & D).

Lloyd Butler VK5BR
18 Ottawa Avenue
Panorama, SA. 5041
AR

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- *Many other features too numerous to mention here*
- *2125-2295Hz + 1300-2100Hz Tones (1200-2400) opt.*

KENWOOD

TS-711A
2 m All mode Transceiver

KENWOOD

TS-430S
HF TRANSCEIVER

AR86

TEST EQUIPMENT — LARGE RANGE OF HIGH QUALITY SECOND- HAND GEAR: HEWLETT PACKARD, TEKTRONIX, MARCONI, BOONTOON, B W D, BRUEL & KJAER, GENERAL RADIO, FLUKE, ATC, *etc.*

WE SERVICE WHAT WE SELL

Silent Keys

It is with deep regret we record the passing of —

MR JAMES BLACKWOOD VK3ABL
MR R N RIDE VK3NH
MR H H (HORRIE) WOODFORD VK3BZH
12.10.85

Obituaries

CLEMENT JACKSON DAY VK3GY

Clem became a silent key on 5th October 1985, at the age of 73 years, after operations and treatment the previous year. Clem survived his wife, Joy, by only three months, as she died suddenly on 29th July, which was a great shock to Clem, contributing to his passing.

Clem was born in Melbourne, but as his father was a postmaster, the family made several country moves before Clem became a part of the work-force. At this time, his father was PM at Camperdown, Vic, so Clem started as a message boy at the Post Office.

Whilst there, learning to read the telegraph sounder as part of his duties, he studied for, and passed the examination for his AOCP, and was allocated the call sign, VK3GY, in 1930.

Clem proceeded to operate on 7MHz during the broadcast hours, and then on the 200 metre band, with music in the late evenings, and Sunday mornings. Clem received reports from listeners in the Western District, and as far away as New Zealand.

He also helped a number of local amateurs get their AOCP.

Later, Clem joined the personnel section of the PMG's Department. At the outbreak of the war, he enlisted in the RAAF, starting on Course 21, Wireless Maintenance Mechanics, in Melbourne. This was where the writer first physically met Clem, after a number of QSOs on 7MHz, dating from 1930.

Upon pass-out from the course, Clem was posted to RAAF Advance Signals, Coomalee NT, and later to No 11 signals unit across the road. After 20 months of tropical service, we were both posted south, Clem going to Essendon.

While in Melbourne, Clem married Joy Marsland, a sister of Jim VK3NY.

After the war, Clem returned to his old position in the PMG, but was told to apply for a new position with the newly formed Department of Civil Aviation, in which he served until his retirement, rising to the position of Assistant Director of General Administration.

Between work and family commitments, radio took second place, but on retirement Clem and Joy decided to return to country life and settled in Wallington, Victoria. This move enabled him to become active on both the HF and VHF bands. It also allowed him to become an active participant in the RAOTC over recent years, and at the time of his death, was Assistant Secretary of the Club.

Clem will be sadly missed by his many friends, and particularly by the writer, as both families have enjoyed an association in excess of 40 years. Clem always had a cheery greeting, and an uncanny readiness to assist where, and whenever possible.

To all of Clem's family we extend sincere condolences for the sudden loss of both parents in such a short period.

Ed Manifold VK3EM

HORRIE WOODFORD VK3BZH

Horrie came on air as an amateur in October 1978.

After losing his sight a few years previously, he attended classes at the VK3 Divisional rooms, was first licenced as VK3NQI, and obtained the full call of VK3BZH shortly afterwards.

But Horrie's interest in communication dates from CMF days in the early 30s, when he served in a signal unit. Subsequently, he enlisted in the AIF in 1939 as a signals officer, held the regimental number VX42, and was awarded the OBE for his services with the 9th Division Signals at Tobruk and Alamein.

During more recent years, we remember him as a kindly man with varied interests, many involving the welfare of others.

Horrie passed away on 12th October 1985, and deepest sympathy is extended to his widow Hilda, and his family. He will be sadly missed, both on and off air.

Jim Payne VK3AZT

BILL O'BRIEN VK2BWO

It is with the deepest regret that I announce the passing of one of the most popular, and beloved radio operators of recent times, namely Bill VK2BWO.

Bill was active as a SWL, and as a member of the radio club in the eastern suburbs area as far back as the 1930s, but it was not until recent years that he obtained his licence, firstly as a novice — VK2PWO, and then upgrading to VK2BWO.

During the time he spent on air, Bill had the happy knack of making a friend of everyone that had the good fortune to make his acquaintance. On their behalf may I say thanks, Bill, for your companionship, advice, and kind sympathy, you will be ever in our thoughts.

I first met Bill at the opening of the WIA building, at Parramatta, and it was Bill and his XYL, who hopped in to lend a helping hand. It seems that this was Bill's way of life — to be ever there with a helping hand - and by the number of friends from all walks of life who were present at Bill's farewell, his friends on the air are just a small segment of the many who mourn his passing.

To Joan and his family, sincere condolences.

Tom Delandre VK2JTD
AR

JAMES D BLACKWOOD VK3ABL

Jim passed away on the 16th October 1985. He was a member of the WIA and also, the RAOTC.

Born in Melbourne in 1915, Jim obtained his MSc degree at Melbourne University and in 1951 obtained his PhD at Cambridge University. In 1938, he joined the staff of the Munitions Supply Laboratories, in Melbourne, and was transferred to the MSL Branch Laboratory, Penfield SA, in 1942.

After the war, Jim returned to MSL and was transferred to the Chemical Engineering Division of the CSIRO in 1955, where he remained until he retired in 1975.

Jim obtained his AOCP in 1946. He was both artistic and practical. His interests included painting, music, and woodworking.

Jim will be missed by his many friends.

He is survived by his widow Grace, and daughters, Anne and Mary, to whom we extend our deepest sympathy.

Ken Seddon VK3ACS

THOUGHT FOR THE MONTH

It is a sad commentary of our times when the word HONESTY is preceded with the word OLD-FASHIONED.

COMMUNICATION?

Lindsay Lawless VK3ANJ
Box 112, Lakes Entrance, Vic. 3909

The occasional Sunday morning gathering of experts on the sunny side of Jim's verandah was discussing the last zone meeting. *"I don't know what the president meant when he said we can't communicate,"* said Nobby. After a pause to top up the glasses Jim said *"I have made a study of the subject since the meeting and I can now give you the benefit of my acquired wisdom."*

Jim was noted for his philosophies and the gathering was respectfully silent as Jim continued. *"My favourite dictionary defines communication as the act of imparting or exchanging information and defines information as items of knowledge. If you freeze on the push to talk switch and natter on like old George here you are not imparting or exchanging items of knowledge and therefore you are not communicating."* *"I agree with that"*, interjected Alf," *"also some short exchanges using VOX do not qualify"*. *"My glass is empty"* complained Nobby. *"That's a good example of non-information,"* said Alf *"everyone here can see that it's empty, also the probability of the bottle being empty with you present is very high."* Jim took the hint and transferred another couple from the fridge.

"In addition to my dictionary researches" Jim continued *"I read an article about a bloke called Shannon who worked for the Bell telephone Laboratories in the mid forties; he quantified information and established the basis for the study of information theory. The theories are based on the simple observations made by Alf; if an event is certain it's information value is zero and the higher the probability the lower the information value. Using this concept he was able to develop techniques for maximising the amount of information in encoded transmissions such as teletype and data transmission systems."* *"Very interesting,"* said Alf *"I suppose the moral to that story for our benefit, is to keep the information value of our on air exchanges as high as possible and avoid redundancy."* *"I hate to interrupt,"* exclaimed Nobby *"but there's a fly in your beer Jim and he's just avoided being sucked in with your last gulp. Is that information?"* *"Your communication is received and understood"* said Jim emptying the remains onto the Geraniums.

"I like just talking to my friends on air" said George *"and they are the same. It's good to pass the time of day with friends you see only occasionally. It's all very well to advocate efficient communication; I can be an efficient communicator when I have to be but to me there is more to the hobby than that."* Everyone understood old George's point but secretly disagreed; George's turn on the club net was like the commercials on TV, time to put the coffee on or attend to calls of nature.

"Speaking of efficient communicators," said Jim *"here come the wives. Quick, get rid of half the empties."*

AR

QSP

MORE PRIVILEGES

As of 27th September 1985, Canadian amateurs are allowed to use CW and phone at the maximum legal power on the entire 160 metre band, 1.800-2.000MHz. Repeater use at 10 metres is also authorised. Also ATV with a 6MHz bandwidth is authorised, and SSTV operation no longer requires a special endorsement.

There is also word that there is a possibility of a Canadian Novice Licence, and a deregulation of mode sub-bands, which would allow Canadian amateurs to operate any mode, anywhere in their amateur allocation, relying only on voluntary adherence to recommended band plans.

Adapted from The ARRL Letter, 24th October 1985

SOLAR GEOPHYSICAL SUMMARY — September 1985

Solar activity was very low with no energetic flares observed. The solar disc was without spots for much of the month and this is reflected in the 10cm flux, which had a high of 72 and a low of 67. The monthly average, 69.5 was the lowest since the last solar minimum.

The persistently low flux values of recent months suggests that the solar minima can be earlier than previously estimated — as close as mid-1986.

10cm flux readings were 1-4=72; 5,6=71; 7=70; 8=69; 9=70; 10=69; 11,12=68; 13-16=70; 17=69; 18,19=70; 20-24=69; 25,26=68; 27=67; 28-30=68. Average was 69,5. The sunspot average was 3.9.

GEOMAGNETIC

14th September — The geomagnetic field was at storm levels 0600-1500UTC A=27.

16-17th September — The field was active on 16th and at minor storm level 1100-1300UTC. Unsettled on 17th with active levels 1000-1200UTC. A=25,16.

19th-21st September — The field was at storm level on 19th particularly between 0800-1300UTC and 1530-1730UTC. Active on 20th with disturbance ending around 1500UTC on 21st. A=28,21,18.

24-27th September — The field was generally at unsettled to active levels. A=15,18,17,17.

The quietest days were: 4=2 5=2 3,29=4 2,12,30=5.

Data courtesy of the Department of Science IPS Radio and Space Services.

AR

VOA USES AMATEURS

When the catastrophic earthquake rumbled ashore from the depths of the Pacific Ocean off Acapulco, Mexico, toppling buildings and killing thousands in Mexico City, it also cut off the nation from the rest of the world.

All communication links snapped along with most of the city's electric and telephone.

In the Voice of America's Washington newsroom, as reports of the earthquake came in, Chief Assignment Editor Edie Apple tried to call VOA Correspondent Gary Tredway, in Mexico City, but the line was dead.

Ms Apple, a veteran correspondent, assigned Charge Editor, Andy Guthrie to make contact in anyway possible. Guthrie turned to the VOA maintenance engineers who operated the VOA amateur radio club station K3EKA. Three members of the club, Hugh KB3TB, Richard WA9VIV and Greg K9FL quickly turned a section of the work bench into a listening post.

Within minutes, the words "This is XE1VIC, go ahead with your traffic" were heard on the VOA receiver. The station of Victor Keller XE1VIC quickly became one of Mexico's few electronic links with the outside world. Broadcasting in both Spanish and English, Victor ably handled international traffic, relaying messages from the news media and anxious relatives about family members in the quake zone.

The VOA equipment, an FT-757 and scaled-down antenna system, were not reliable enough to consistently reach Victor, so it was necessary to use relay stations, WB6HVN, WA5PME, and KC3EK to pass urgent messages to Correspondent Tredway and Reporter Lucy Conger. The reporters were urged to make their way to any amateur's station so they may relay information of the earthquake to VOA's 24-hour news service. (It had been decided not to re-broadcast any amateur transmissions to conform with FCC regulations).

Eventually, Tredway and Conger were able to file a report via Carlos Arciniega XE1MT to Julian WA5PME, and the extent of the quake's damage was prepared for VOA transmission.

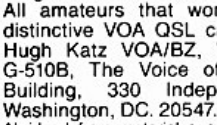
Plans are being studied to use the facility of K3EKA in future whenever regular communications are not available.

The Voice of America is the US Government's International Radio Broadcasting Agency, transmitting more than 1 300 hours of programming every day in English and 41 other languages, to an estimated audience of 110-million listeners, each week. A branch of the United States Information Agency, VOA first went to air in February 1942.

The program service broadcasts news on-the-hour, around the clock. The programming, which includes music and features about the United States, is designed to inform foreign audiences about America.

The VOA Radio Club (K3EKA) operates on an irregular schedule, as engineering duties permit. All amateurs that work the station receive a distinctive VOA QSL card. The QSL address is Hugh Katz VOA/BZ, VOA Radio Club, Room G-510B, The Voice of America HHS - North Building, 330 Independence Avenue, SW, Washington, DC. 20547.

Abridged from material supplied by Andy Guthrie, Charge Editor, Voice of America. AR



QSP

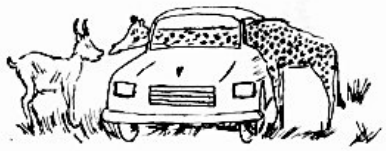
HELP WANTED

The VK5 Division is urgently in need of participating members. The prime need is for a volunteer to act as Programme Organiser for the Divisional Meetings. There are only four meetings left before the next Council election, so ***Can You Help?***

Members are also required to attend the monthly meetings. Meetings are held for the benefit of all members, so come along and participate in your Division.

From October's South Australian Journal

NOTICE



DEADLINE

All copy for inclusion in the March 1986 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by midday, 21st January 1986.

Hamads

PLEASE NOTE: *If you are advertising items FOR SALE and WANTED please write each on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. Please do not use scraps of paper.*

* Please remember your STD code with telephone numbers
* Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
* Copy in typescript, or block letters — double-spaced to **Box 300, Caulfield South, Vic. 3162**
* Repeats may be charged at full rates
* QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being resold for merchandising purposes.

Conditions for commercial advertising are as follows:

$2.50 for four lines, plus $2.00 per line (or part thereof)

Minimum charge — $2.50 pre-payable

Copy is required by the Deadline as indicated below the indexes on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver & Transmitting Applications. For data & price list send 105x220mm SASE to: **RJ & US IMPORTS,** Box 157, Mortdale, NSW. 2223. (No enquiries at office ... 11 Macken Street, Oakley). Agencies at: Geoff Wood Electronics, Rozelle, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

WANTED — ACT

TEN-TEC ARGONAUT TCVR: Realsitic price paid for quality rig. Write to R Jenkins VK1UE, QTHR, with details and price.

WANTED — NSW

MAGAZINES: Amateur Radio. I need the following issues — Aug & Dec 1934; Aug 1935; Sep 1938; Nov & Dec 1939; Jan-Mar 1940; Aug 1940 — Nov 1945; Jan-Nov 1946; Jan-Aug 1947; Nov-Dec 1954; Aug & Dec 1955; Oct 1956; Jan 1957-Nov 1963, most issues, Jan-Mar 1965; Feb 1967; Sep 1969; Mar, Aug & Dec 1977. Contact Brian VK2EFD, QTHR. Ph: (049) 77 2178.

SOCKETS: 2 for 4-1000A tube. Gordon VK2ALM. Ph: (065) 53 5353 after 5.30pm.

YAESU FT-790R: Or similar multi-mode 70cm tcvr. VK2EFA, QTHR. Ph: (080) 5285

WANTED — VIC

TELETYPE MODEL 14: Siemens and Creed Tape Distributers. Other equipment to suit these models. Colin Gracie, Cavendish Post Office. Ph: (055) 74 2319.

TEST EQUIPMENT: In good condition. HP-410B VTVM or Boonton 91H. Also HP411AR RF millivolt meter. Would consider other types of similar equipment. B Wilton VK3XV, QTHR. Ph: (03) 527 4029 — Reverse charge after 5pm.

WANTED — QLD

PHILIPS OR MULLARD TX ELECTRON TUBE HANDBOOK: Wanted urgently. Needs to show socket connections of double tetrode valves QQ and YL series. VK4EF, QTHR. Ph: (07) 38 1803 AH.

WANTED — NT

AN-PRC 9A OR 10 SET VHF TCVR: Trevor VK8CO, Box 40441, Casuarina, NT. 5792. Ph: (089) 27 9256 AH.

FOR SALE — NSW

CLOCK (24 HR) WORLD TIME: 10" quartz wall unit with brochure & instr. Never used. $40. Allan VK2FH, QTHR. Ph: (02) 969 8703.

COOK BOOK: The VK Amateur Radio Cook Book now on sale. Great value. 64 pages. $5 posted. VK2ZYE, PO Box 126S, South Wagga, NSW. 2650.

ICOM IC-720A TCVR: With power supply. 10-160m inc WARC bands & gen cov rx. $730. Icom IC-290A 10W all mode 2m mobile. 5 mem, scan, $330. Lunar 2m 10-80P, 2m power amp, 80W out FM/SSB. Rx preamp $180. All ex cond. Mike VK2BMR, QTHR. Ph: (02) 639 8643.

KENWOOD TS830S TCVR: $850. Swan TB2A beam ant. $155. CDE HAM II ant rotator with control. $150. Antenna mast with cables. $150. Adigawa PM2H power/SWR meter. $65. Zephyr 21ZA mic in grey h'piece. $15. Ph: 871 7758.

FOR SALE — VIC

FRG-7700 SW/HF COMM RX: Inc ant tuner. Full documentation inc. VGC. $450. Robert. Ph: (03) 350 6971.

ICOM IC-490A: 70cm multi-mode tcvr. As new. $500. Match 12V 5A power supply for above. $60. Chez. Ph: (03) 592 0461.

ICOM 720A: Continuous tcvr and IC-HM7 mic. $850. Icom PS-15 power supply. $135. Icom AT-100 auto ant tuner (cost $500) $300. Mint in cartons $1200 as set. Four band vert ant $45. Yaesu FC707 ant tuner with low pass filter. $85. Ron VK1VS/3, QTHR. Ph: (03) 597 0515.

FOR SALE — QLD

TEN-TEC (OMNI) HF TCVR: Auto tune, digi readout, match 20A power supply with ext spkr & amp meter built-in, Ext VFO inc. All in good cond. $850 ONO. Colin VK4EX, QTHR. Ph: (070) 51 1315.

Advertiser's Index

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* **HF, VHF, UHF Antennas:** MOBILE AND BASE
* **World's largest range of antenna rotators:** OVER 15 DIFFERENT MODELS
* **Baluns, LP & HP Filters**
* **Morse Keys and Electronic Keyers**
* **Morse Trainers and Code Practice Oscillators**
* **Audio Filters, Notch Filters, Woodpecker Blankers**
* **Australia's largest range of Communication and Scanning Receivers**
* **We are Australia's only supplier of sophisticated special Communications Systems such as RTTY, SSTV, Computer Interfaces, etc**
* **Amateur and Professional Code Converters**
* **Many exciting products for the SWL**
* **Printers and Monitors**
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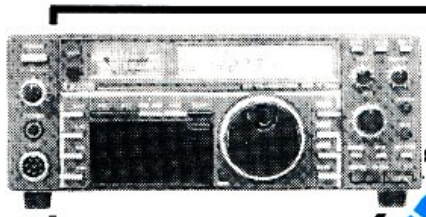

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VIC STORE:
288-294 Queen St, Melbourne, Vic. 3000
Entrance from Little Lonsdale St
Ph: (03) 67 8551 or 67 8131

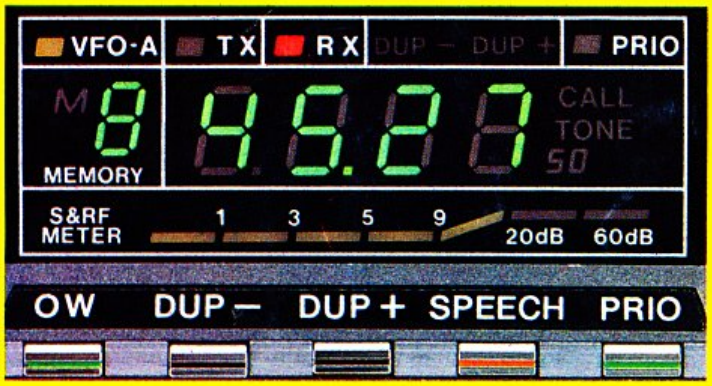
Correspondence & Mail Orders: Box K21, Haymarket, NSW. 2000

ICOM IC-27A

The Most Compact 2 Meter Mobile!

Now ICOM presents an important breakthrough in two-meter mobile communications, the IC-27A. The smallest two-meter mobile available, the IC-27A measures only 38 millimeters high by 140 millimeters wide. As an added bonus, the IC-27A, through ICOM engineering, is able to contain an internal speaker to provide ease of mounting and make the unit one small compact complete package.

25 Watts. In such an incredibly small package, the IC-27A is able to provide 25 watts of output power. And even though the IC-27A is the smallest available two-meter mobile unit, it has sacrificed none of the features found in fully featured VHF mobiles.



32 PL Frequencies Option. The IC-27A is available with optional 32 PL frequencies ready to go and controlled from the front panel knob. Each PL frequency may be selected by the main tuning knob and stored into memory for easy access along with frequency.

10 Memories. The IC-27A has 10 tunable memories available to store receive frequency, transmit offset, offset direction, and PL tone.

Memories are backed up by a lithium backup battery, which will store memories for up to seven years.

Speech Synthesizer. As an added plus, the IC-27A features an optional speech synthesizer to verbally announce the receiver frequency of the transceiver through the simple push of a button. This allows the operator to hear what frequency he is operating on without looking at the transceiver.

Scanning. Included with the IC-27A is a scanning system which allows scanning of memories or scanning of the band. Each memory may be scanned between programmable limits.

Priority Scan. Priority may be selected to be either a memory channel or a VFO channel. By using sampling techniques, the operator can determine if a frequency he is interested in using is free or busy.

Microphone. Each IC-27A comes complete with a microphone which includes a 16-button touchtone pad for access to your favourite repeater or for dialling through an autopatch.

THE ICOM 27A is a superior piece of amateur equipment engineered and built by ICOM to provide superb performance in the mobile radio environment. See the IC-27A at your local ICOM dealer.

The IC-27A comes complete with microphone. Note that the microphone shown is an optional model.

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